ISSUE #005
March 2025

RED AMERICA

JOURNAL OF THE AMERICAN COMMUNIST PARTY

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Issue #005
March 2025

Publisher: American Communist Party
Website: acp.us
Email: redamerica@acp.us

ISBN: 978-1-300-51326-1

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Message from the Chairman

Haz Al-Din[1]

Dear comrades,

With the ramping up of our recruitment drive, increasing international recognition, increased efforts toward participation in the labor movement, and acceleration of political contradictions domestically, our Party is now facing more intensity and pressure than at any point since its declaration. We now enter the storm that will define the integrity of our organization and prove to be among the most formidable tests for our American Communist Party. It is necessary to briefly reflect upon the factors that have come to shape our current circumstances of unprecedented intensification and success.

As we all know, the overwhelming bulk of our Party activity is mundane in nature. Not once have the enemies of our Party emphasized the fact that in isolation, a given form of Party and chapter activity is on average rather unexciting and mundane. However, it is precisely the consistent, slow, and steady inertia of our Party work that has brought it on the cusp of the current watershed moment. This reflects the basic dialectical law of the transformation of quantity into quality. The slow, meticulous, steady and patient activity of our

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1. Haz Al-Din is the Executive Chairman of the American Communist Party. He is a political theorist and thought-leader for the Infrared Media Collective.

Party chapters - as long as it remains consistent, unyielding, disciplined, and steadfast - is bound to culminate in great, intense, and exciting successes.

Whereas left-liberal organizations meander between hurried, excited, near-apocalyptic shouting and protesting - and on the other hand, complete despair - it is the steady, patient and consistent work of organization and practice that makes a Party strong. It is just the same as in exercise: the blow-hard and braggart who enters the gym once every blue moon to 'show off' their abilities - will never surmount in strength and capacity the one who exercises consistently, even if they begin with modest weights. Such is the case when it comes to Party organization: Slow and steady wins the race. Slow and steady is precisely how our Party will outlast, outmode, and surpass all other organizations.

And the basic premise of consistent, patient and steady work is adherence to the principle of collective discipline. It is upon this solid foundation - the combination of collective discipline with practical patience - that our Party will begin to take shape as a material factor in American domestic politics.

It is necessary to keep all this mind in light of our current recruitment drive. It is hardly necessary to make great noise with trumpets and bullhorns, promising excitement and immediate, apocalyptic salvation - in order to attract prospective recruits to our Party. What is necessary is the ability to demonstrate to others the fact that our Party activity reflects a viable form of everyday, social existence. What will draw in great quantities of recruits into our Party is the ability to demonstrate how it reflects a specific, viable, and consistent way of living in relation to the rapidly changing circumstances within our country.

I offer these words of advice not in order to stem the great energies and passions driving the movement of our Party - but on the contrary, so as to remind comrades not to hurriedly expend their energies overnight: That great strength derives from consistency, that treading long distances requires steady movement, and that great success stems from repeated and patient trial-and-error.

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The Dialectic of Trump: An Interview with La Tizza

Carlos L. Garrido[1] & La Tizza[2]

1. The Los Angeles Times says: "Trump and Musk are dismantling and shaking the foundations of U.S. democracy." In your opinion, to what extent is this new government "breaking the rules" and to what extent do the elements of continuity prevail?

Western discourse is kind of interesting. Over here we don't say torture, we say "enhanced interrogation." When it's done by those who serve U.S. imperial interests, they're not called terrorists, they're "moderate rebels." I think this is one of those examples where "democracy" is the replacement for

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1. Carlos L. Garrido is a Cuban American philosophy professor. He is the Director of the Midwestern Marx Institute and the Secretary of Education of the American Communist Party. He has authored many books, including *The Purity Fetish and the Crisis of Western Marxism (2023)*, *Why We Need American Marxism (2024)*, *Marxism and the Dialectical Materialist Worldview (2022)*, and the forthcoming *On Losurdo's Western Marxism (2025)* and *Hegel, Marxism, and Dialectics (2025)*. He has written for dozens of scholarly and popular publications around the world and runs various live-broadcast shows for the Midwestern Marx Institute YouTube. Subscribe to his Substack: *Philosophy in Crisis*.

2. La Tizza is a digital magazine that aspires to become a thought platform to debate the future of the Cuban revolution project, its relationship with the political practices of the day, and its possible futures.

“imperialism,” or at least, the institutions through which imperialism has been carried out in the last four to five decades.

The reality is this, Trump has shocked a lot of people. Not because he is doing things he did not promise, but precisely the contrary, because he is doing – certain things at least – that seem to fulfill promises he made in the campaign trail. This is, of course, unheard of for a U.S. politician. Lying is a consistent part of the job for the American political class. In some spaces I hear that they pad their CVs with mentions of theatre classes they took in high school. They must show the oligarchs they’re up for the task!

But seriously, what has Trump done to shake things up? I’ll mention a few things: move towards banning USAID and NED, the two central institutions (along with the CIA) which have carried out regime change operations for decades (as Cubans, we know very well how these institutions operate). In less than two months, Trump has taken serious steps towards ending the proxy war against Russia, a war that has taken the lives of hundreds of thousands of people thrown in the meatgrinder to serve the interests of NATO and US imperialists. In addition, Trump has taken in serious consideration removing the U.S. from NATO, which would, of course, lead to its likely collapse. Let us recall that NATO is the farthest thing from a “defensive” institution. It is the organ that viciously bombed and dismembered the former Yugoslavia. Who can forget about the role it played in overthrowing the Gaddafi government in Libya, transforming what was the most prosperous African country into a hellhole with literal slave trades. Just these steps warrant Trump being labeled the most progressive president since Franklin Delano Roosevelt. I wish I was simply being hyperbolic, but these are serious assaults on some of the most indispensable institutions of U.S. imperialism.

In addition to this, Trump has proposed creating a national fund and potentially buying TikTok with it. This would be a monumental return to a Hamiltonian style American economics, which is a lot closer to a socialistic style of banking than the current federal reserve. If TikTok gets bought with this national fund, that means that the first amendment (freedom of speech, press, etc.) is protected under it. As someone who belongs to a communist Institute that, after amassing almost half a million followers on TikTok, has had seven accounts banned, this would be superb for disseminating revolutionary, anti-imperialist information.

In terms of Gaza, the aggressive rhetoric has certainly been there. First, he said he would buy it. After realizing how silly an idea this is (buy it from whom?),

then he said he is just going to "take it." This is certainly troublesome rhetoric. But do we remember what he was saying he'd do to the Democratic People's Republic of Korea just a year before the establishment of a historical diplomatic deal? Trump quite literally said that he would make the DPRK disappear, and moments after, he is the first U.S. president to step foot in the country. From threatening to obliterate the DPRK to laughing with Kim Jong Un about hoping to look "nice and slim" in the picture, what we see here is the same old Trump from his old show, *The Apprentice*, where he would play hard ball, feigning a position of strength and power, before landing deals. Could we expect the same fate in Palestine? Could this time next year, as occurred in the DPRK, we see a Trump visit to Rafah, where he meets with Hamas leadership and shares some laughs? While I don't think it is likely, I also didn't think he becoming buddies with Kim was either.

For the neoconservative imperialist establishment, both its "liberal" and "conservative" wings, this is heretical. It is, as far as we can see, an actual assault on the Deep State that governs U.S. policy. That is why the legacy liberal media, like the Los Angeles Times, is taking it as an assault on "democracy." For them, democracy is nothing more than the institutions of the U.S. empire, used to formally "spread democracy and human rights," but in reality, just debt-trap and loot countries of the global South. It is ludicrous, for them, to cut funding to the fascist state of Ukraine. After all, they have spent the last decade telling us that Ukraine is a beacon of democracy fighting against the authoritarian Putin regime. Let's not be fooled, this is why they hate Trump. This is why they consider him a threat to "democracy."

I must mention this also, since it is something the media brings up to pull the heart strings of us Hispanics: the discourse on immigration is purely made to inspire fear. Statistically, Trump is deporting almost half of as many people as Biden. Biden, just like Obama before him, was the true "Deporter-in-Chief." I'll cite a recent study on the subject, for those who find this to ring untrue: "U.S. President Donald Trump deported 37,660 people during his first month in office, previously unpublished U.S. Department of Homeland Security data show, far less than the monthly average of 57,000 removals and returns in the last full year of Joe Biden's administration."[3] Why is it, then, that all we hear about from the media is immigration hysteria? Why should undocumented

3. Ted Hesson, "Trump deporting people at a slower rate than Biden's last year in office," *MSN* (February 22, 2025): https://www.msn.com/en-ph/news/world/trump-deporting-people-at-a-slower-rate-than-biden-s-last-year-in-office/ar-AA1zAeFR?ocid=BingNewsSerp

immigrants be more afraid of a Trump administration than a Biden one, when, statistically, they were twice as likely to be deported under Biden?

None of this is to say that Trump is an anti-imperialist hero and champion of the working class. It is likely that on labor politics, he will be more aggressive against unions, and the National Labor Relations Board, than Biden was. But in terms of foreign policy, the steps taken so far are monumental. And it is these steps, and the crude, vulgar form that he carries himself with, that has won him the hatred of the liberal pundits of empire.

However, I do think a lot of this is too good to be true. If I can, I will cite from a recent article I wrote for The China Academy on the subject:

> *As the consciousness of the people outmodes the woke model of imperialism, the ruling class needs a clean slate. Trump and his cohorts of fake dissident rightists, carrying out an anti-woke crusade, was the perfect alternative. At a time when the American people want to be dissident and anti-establishment, give them the same status quo but in the form of dissidence. Give them people who fight against the form imperialist ideology has taken in the last few years, but not against imperialism itself – not against the system that produced it in the first place…*
>
> *I've argued previously that this is an age, in the U.S., marked by the necessity of hegemony presenting itself as counterhegemonic. The rulers must, at all times, manipulate the public into seeing them as subaltern, as powerless and waging a crusade against the elites themselves. From conservatives, to liberals, to the various Trotskyite "leftists" and "democratic socialists," all American politics is coming more and more to take the form of dissidence. It is an aristocracy of capital that survives through the conceit of continuously struggling against itself for power. Like in Kafka's* The Trial*, where the court bureaucracy is reproduced precisely by presenting itself as powerless subjects subjugated by the system, the dialectic of American political authority today also takes the form of this feigning of impotence to sustain their systemic omnipotence. Power sustains itself through the pretense of powerlessness.*
>
> *And now we are here. In a Trump presidency that is dismantling USAID – one of the wretched henchmen of "humanitarian imperialism" – and that is moving towards possibly doing the same with the National Endowment for Democracy and many other institutions tied to the modern form of legitimizing, and carrying out, imperialist assaults.*

I would like to think this is a revolution against a parasitical Deep State sucking the host republic dry, as Scott Ritter has suggested. I really hope it could be that, and that the debt jubilee that Ritter claims is possible with this "revolution" pans out.

But my Marxist common sense, my understanding of the ever-evolving forms of ideologically justifying U.S. imperialism tells me that, perhaps, something else is going on: A switch back to a previous form of legitimation.

Perhaps a turnback to the dominance of the offense-as-defense model that we saw in the Cold War and in the first decades of this century. This one certainly seems to be dominant in the discourse around China, which is presented as an "existential threat" to the U.S.'s security and geopolitical standing. Trump's National Security Advisor, Michael Waltz, has said that "we are in a Cold War with the Chinese Communist Party" and that China is an "existential threat to the US with the most rapid military build-up since the 1930s." This discourse on China as an existential threat, which is very common in the foreign policy establishment, is foundational for the offense-as-defense model of legitimizing imperialism.

Some analysts have suggested a return to a Monroe Doctrine style imperialism, where one is more open about the aims of conquest for conquest's sake, veiled thinly with an appeal to a divine mandate. This is another form we have seen in the history of empires. It is clear that this model of discourse is employed in the rhetoric used for U.S. foreign policy in the Western Hemisphere.

The truth, however, is that we don't know. We'll have to wait and see what actually happens.

This indeterminacy isn't simply in our knowledge of the existing state of affairs. I do not think that the problem, at the moment, is one that is located in our knowledge of the world, of how U.S. imperialism will develop in the coming years. The indeterminacy is in the world itself. The U.S. regime is itself scrapping to figure out its next moves, to see what it can do to sustain at least a semblance of hegemony in a world where the Weltgeist *is moving eastward.*

What I think we could be the surest of is the following: this isn't an anti-imperialist revolution occurring within the belly of the beast via the hand of the billionaires themselves. When some of the leading billionaires, NGO's, think tanks, and financial investment firms are perfectly fine, or even supportive, of the Trump administration, that does not inspire

> *confidence in the thesis that he is carrying out a great assault against the system. After all, if anyone personifies the system best, it is those profiteers who have continued making money hand-over-fist irrespective of who's been in the White House. They compose the unelected body of rulers that stays the same with every change in administration. Together with the intelligence agency who serve their interests, they make up the famous "Deep State." When BlackRock CEO Larry Fink tells us, as he did during the presidential campaigns, that he is "tired of hearing that this is the biggest election in your lifetime," and that "the reality is over time, it doesn't matter," perhaps we should listen.*[4]

2. Between 2016, Trump's first "election" – he did not win the popular vote, nor in 2020 – and 2024, how has the domestic political landscape in the US and international conditions changed from his first term until now, how has that change affected the strength with which Trump arrives this time?

Since I have extended myself with the first question, I will aim for brevity with this one. The truth is the American people are sick and tired of the political establishment. Only 19 percent of them think their representatives actually represent them, and only 11 percent trust the mainstream media. This is a deep crisis of legitimacy that we have in our hands. The American people are struggling to make ends meet, they are drowning in debt, and all they see is the Biden regime sending hundreds of billions of their tax dollars to fund Nazis in Ukraine and Nazis in Israel.

Trump, for better or for worse, is seen as a political outsider. His profile is tied to being a dissident. He didn't have to get into politics. He was already a billionaire. He came in to exert the will of the people, to dismantle the Deep State that has destroyed America. That is how the narrative goes. And even if people realize a good amount of it might be a load of crap, it is at least, in rhetoric, the dissidence they have been looking forward to.

The MAGA base, for those that don't know, is primarily the disenfranchised American working class. As the philosopher and political theorist Haz Al-Din has previously put it, this is the only force in American politics that has reintroduced, after decades, a sense of true, dissident partisanship in the

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4. Carlos L. Garrido, "Trump Is Merely Using Change to Maintain U.S. Hegemony Unchanged," *The China Academy* (February 19, 2025): https://thechinaacademy.org/trump-is-merely-using-change-to-maintain-u-s-hegemony-unchanged/

American political horizon. Yes, it remains in an embryonic form. Yes, it has attached itself to this goofy billionaire. But nonetheless it is there. They are to us what *el campesinado* was for Fidel and the Cuban revolutionaries. And if they have attached themselves to Trump, that reflect more negatively on the entity that called itself the "left" from the previous period, than it does positively on Trump.

Depending on how this Trump administration goes, that working class base, if dissatisfied, may be up for grabs. This is where my party, the American Communist Party, could step in and show working people that only they can save themselves, and that the rational kernel they thought they saw in Trump (e.g., dismantling the war machine, the parasitic Deep State, etc.) can only be realized through socialism. And to get there, we need a party that upholds the interest of our working masses. That is what our party, as the reconstitution of the old and dignified Communist Party, aims to be.

3. A federal court has blocked Musk's department's access to data from the Treasury Department's payment system. This can serve in the narrative carried out by Musk and Trump that there is a great conspiracy in the state to commit corruption, against which they fight. Can the future stability of the US state be affected by the marked rightward polarization of Trump voters in favour of a growing scepticism about the legitimacy of that state?

Historically, the "left" are those who stood on the side of progress, on the side of overthrowing the ruling institutions of power. This is what the Jacobins were, and the term "left" itself comes from the fact that they stood to the left on the national assembly. Can we really describe this attack on the institutions of imperialist bureaucracy a "rightward polarization"? I am not so sure. Let us recall what Marx and Engels wrote in *The German Ideology*: "we do not set out from what men say, imagine, conceive, nor from men as narrated, thought of, imagined, conceived, in order to arrive at men in the flesh. We set out from real, active men, and on the basis of their real life-process we demonstrate the development of the ideological reflexes and echoes of this life-process."[5] We must look beyond the superficial proclamations people make. We must judge them by their actions. Let us recall the words of Comandante Fidel Castro in his unforgettable 1979 speech at the UN: "¡Basta ya de palabras! ¡Hacen falta

5. Karl Marx and Friedrich Engels, *The German Ideology* (Peking: Foreign Language Press, 2022), 13-14.

hechos!"[6] From the actions, from the facts, of Trump's administration (and not simply from his mean words), it is evident that his administration is far more "left" than any of the previous ones we have seen.

However, as I explained in the first question, if the U.S. elite was smart (and I don't think they're dumb), this is what they would do. They would satisfy the thirst for dissidence in the populace by using the crisis of legitimacy as a big spectacle to tear down all the old imperialist institutions, only to erect new ones in their place. In the short run, of course, this will have a stabilizing effect. In the long run, however, this will show itself to be nothing more than a bandage on a gushing wound.

4. Trump is a millionaire, but a "marginal" millionaire in the sense that he does not command branches of capital central to contemporary capitalism. He is not the first oligarch to do what he is doing, examples are in the US, Italy, Chile, etc. However, Elon Musk, for example, is a Big Tech capitalist, a leading area of the current mode of production. How novel is it, for North American capitalism, and perhaps for world capitalism, that capital expressly renounces its command in the shadows in order to access the visibility of public policy to govern society?

I think the Musk phenomenon has intensified the contradictions in Trump. Trump, in many ways, nicely captures the class fracture in America. On one side, his support comes from angry working class people who want real, radical change (the base historically Marxists have pulled from). This is the heart and soul of MAGA. On the other side, there are sectors of big capital that have thrown their whole lot in behind Trump. Certainly, in this 2024 campaign, it became evident that the Silicon Valley oligarchs had to jump on the Trump train. This intensifies the contradictions, because the interests of these oligarchs and those of the MAGA base couldn't be more at odds with each other. While it is certainly true that Musk has been influential and public in this 2024 campaign, this isn't necessarily a coming-into-the-light of the capitalists that have previously, in shadowy manners, controlled the U.S. government (as with all capitalist states). We have to recall, as Lenin already saw, that finance capital is ultimately, in the era of imperialism (and superimperialism) the one that calls the shots. The role of big banks and investment firms has remained in the shadows. These are the real string pullers, not necessarily Musk and Silicon Valley – problematic though they might be in their own right.

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6. Fidel Castro, "Discurso en la ONU (1979)," Cuba.Cu
http://www.cuba.cu/gobierno/discursos/1979/esp/f121079e.html

5. During Donald Trump's previous term, the position of Secretary of State did not remain unchanged. And it was not the only position that changed in that cabinet. Some people on social networks are hoping that Trump's temperament may compromise the permanence of someone like Marco Rubio at the helm of US foreign policy or, conversely, Marco Rubio will not be able to reconcile with the more pragmatic wing of the Trumpist sectors. How much can Cuba place hope in this possibility? What could be the main tensions between Trump and Rubio (and more than themselves, the wings of power they represent) regarding the foreign projection of the US government?

I don't think that Trump, this time around, is going to wait as long as he did to kick people out of his government who do not follow his lead. I think he learned from the experience with John Bolton and Mike Pompeo. If Rubio stays it is on Trump's terms. The Cuban American Mafia in Miami is powerful, but now they can't dangle removing endorsement, as they did in 2016, in exchange for supporting the asphyxiating and genocidal blockade on Cuba. Remember that Trump initially wanted to continue Obama's thaw policy with Cuba, and it was the far-right, fanatically anti-communists in the Cuban American community that forced him to take the position he did in his first administration. I know Trump has added Cuba back on the State Sponsor of Terrorism list, shortly after Biden's purely symbolic removal. However, I think this is a place where we must be strategic. Trump has announced that the slogan of his campaign is "common sense." It isn't commonsensical to sustain a 60+ yearlong blockade on Cuba. It makes the U.S. look horrible internationally, as year after year the whole world votes in the U.N. in favor of lifting it.

The American people, and even certain business sectors, want this blockade lifted. I think that, if approached intelligently, relations between Cuba and the U.S. could even surpass those that were established in the Obama era. But strategic thinking must predominate. The U.S. blockade doesn't just affect Cubans, it affects tens of thousands of Americans that die a year because they don't have access to Heberprot-P and other Cuban treatments for diabetes and cancer.[7] It is contrary to common sense to sustain a fruitless blockade that not only doesn't achieve the desired outcome of regime change, but prevents tens of thousands of Americans from receiving life saving treatments. I think this commonsense approach should predominate in whatever discourse the two

7. Carlos L. Garrido, "The US Blockade and Its Effects on Cuban Medicine," *Science for the People* (March 06, 2023): https://magazine.scienceforthepeople.org/online/the-us-blockade-and-its-effects-on-cuban-medicine/

administrations could have. There is no reason why the U.S. can have relations with Vietnam, China, and as of recently, Russia, but continue exerting such a strangling blockade on Cuba. It is contrary to common sense. With this new "commonsense administration," this is the approach that I think must be upheld.

6. What is serious and what about overacted stridency in Trump's announcements about the Middle East? What can be expected in that direction?

As I mentioned in the first question, it is hard to tell. Trump often plays hard ball, not to do what he says, but so that a diplomatic negotiation could be had. I do not think he wants to continue this genocidal war on Palestinians. As far as the explicit aims of the Zionist operation, that is, the destruction of Hamas, has completely failed. All the Zionists seem to be good at is bombing innocent children and women. What makes us this that U.S. involvement would be much different? What makes us think that, in the first place, the Zionist offensive hasn't already contained U.S. involvement? We must remember that the Zionist entity is merely the colonial outpost for U.S. imperialism in West Asia. Like a dog tail, it doesn't wag unless the dog does something.

7. If we look for the closest precedent to Trump of conservative government, we have as an immediate reference the government of George Bush. A government to which the reactionary neoconservative sector of American politics and the most extreme wing of the Republican right were almost directly associated. However, Trump arrives in his first term as a supposed "outsider". How much of that was modified? Was it really like that or was it the strategy of the Republican right to present something already known as novel? After a first black president, wasn't the right forced to its own simulacrum of singularity?

I don't think so. I don't think the political establishment, neither the conservatives nor the liberals, had any idea what was going on when Trump entered the political scene in 2015. They all mocked him. The Democrats laughed at how buffoonish he made the Republicans look, and the Republicans hated how informal he was, how much he lacked bourgeois propriety. He was way too vulgar and uncontrollable for them. But yet, he awoke a mass of working class people that had turned away from politics completely, especially after Obama showed himself to be nothing more than Bush 2.0, except with "Hope" as the motto. I think up until the end, the political establishment, conservative and liberal, has hated Trump. I can't say I trust the story behind

the assassination attempts. I think they tried their best to not have him win in 2024, by all means available. There is too much that doesn't add up. Trump has been a big curveball the ruling elite has had to deal with. This could not be any further, in terms of substance and not just cheap rhetoric, from Bush. This isn't because Trump is a great anti-imperialist fighter, but because he is quite unpredictable. No one really knows what the hell he is going to do next. He is also so crude that sometimes he accidentally lifts the mask empire needs to put on in order to operate. Let us recall when he bragged about being very close to taking Venezuela's sweet oil. That is breaking bourgeois propriety, "don't you know we meddle in Venezuela, not for oil, but for human rights and democracy promotion?"

8. Trump has managed to install a certain relationship with the myth of being a defender of the working class, and at the same time he is the demiurge of a broad reactionary anti-rights agenda. Are two dimensions disconnected, or do they have a tight articulation? Is Trump a practical and discursive synthesis of the emergence of the contemporary right?

I think that Trump has been able to tap into a sense of working class partisanship that hasn't existed in the U.S. since at least the 1960s with the Civil Rights revolution. At the same time, of course, like all politicians in the U.S. he has the backing (especially recently) of the class of capitalist oligarchs. This tension, this basic contradiction, is what is shaping the trajectory of the Trump administration. I wouldn't, however, simply see it as a contemporary right wing phenomenon, for a few reasons. First, as I mentioned above, we really have to reinterrogate what it means to be on the left. Being "left" is not about being the most socially liberal. China is, in terms of their culture and social morals, a conservative country. As is Nicaragua, Venezuela, and the Democratic Peoples Republic of Korea. As was Cuba under Fidel. However, all of these countries are as Left-Wing as you can possibly get. Historically, the Soviet Union, of course, was also socially conservative but very left-wing. What determines left or right, in our era, is where you stand on the question of U.S. imperialism. As Marxist-Leninists, we know that the struggle against imperialism is itself a determinate form of class struggle in the age of imperialism. This has nothing to do with how one feels, for instance, about transgender surgeries for kids. One can be "left wing" while being, on these secondary and tertiary issues, socially conservative or liberal.

We must also understand the role that the United States has played, through institutions such as USAID and the NED, in promoting the LGBTQ lobby,

which is used to foster color revolutions and denigrate the social fabric of socialist and anti-imperialist countries. Frequently, this is carried out through the supposed solidarity of organizations that claim to be socialist, but that are bankrolled with tens of millions of dollars by the imperialist state through institutions such as Goldman Sachs' "Philanthropic Fund." The case of the Party for Socialism and Liberation in the U.S. is not the only one.

Now let's look at Trump, in comparison with both Obama and Biden. Obama took us from being in three wars to seven. He overthrew progressive governments, from Honduras to Libya. Biden was the administration that saw the commencement of the intensification of the Zionist genocide in Palestine. Under his administration tension were escalated with Russia to such extremes that the Doomsday Watch nearly hit midnight a few times. Hundreds of thousands were killed in these needless imperial pursuits. Now, Trump in his first mandate certainly pursued, under the guidance of Warhawks like Mike Pompeo, John Bolton, and others, aggressive imperialist policies against Venezuela, Iran, Cuba, and other countries. However, the scale of his imperial pursuits, even under the guidance of such Warhawks, pales in comparison to the administration of the Democrats. It was under the Biden regime that the Syrian government of Bashar Al-Assad was overthrown, installing those "moderate rebels" I previously mentioned into power. This government was central to getting weapons for the Axis of Resistance, especially in Palestine, against Israel. Trump, as I mentioned above, has so far slashed some of the most important institutions of U.S. imperialism. While he might not be "left," and while he is still an agent of the imperialist, if we have to judge it by the facts, its hard not to see how, in this central issue of imperialism (which is the nexus that defines left and right in our era), Trump is far more "left" than both the Democratic Party and the establishment, non-MAGA, Republicans. He is even to the left of the Democratic "Socialists" like Bernie Sanders and Alexandria Ocasio Cortez, who might have socially liberal view on LGBTQ matters, but who have supported the imperialist proxy war against Russia that is backing literal Banderite Nazis in Ukraine.

9. The U.S. "democratic system" accepted the arrival in government of a character with accusations of dozens of crimes and with four criminal cases, some of which have copious evidence. Did U.S. imperialism interpret that it can only respond adequately to this epoch if it anti-democratically "intervenes" in the system itself? Why should we expect anything good from Trump if the system has suspended and intervened in the "democratic guarantees" for the sake of someone like Trump coming along?

I am not sure what this is referring to, mainly because democratic guarantees were stripped during the Biden regime. Black socialists from the Uhuru movement, for instance, were incarcerated and had their houses raided simply because they attended a conference in Russia, whom they thought the U.S. shouldn't be belligerent towards. Our comrades in the Party, all throughout the Biden regime, have been getting harassed and interrogated at airports for traveling on internationalist missions to Russia, China, Venezuela, Cuba, and other countries outside the sphere of influence of U.S. imperialism. These are all violations of rights and democratic procedures, and as far as we can tell from this first month of the new Trump administration, these areas have seen significant improvement.

The reality is this, as Noam Chomsky once said, "If the Nuremberg laws were applied, then every post-war American president would have been hanged."[8] The crimes they accuse Trump of pale in comparison to the crimes against humanity carried forth by previous Presidents. They pale in comparison to the thumbs up the fascist Biden regime gave to the Zionist genocide in Palestine. If they want to accuse Trump, accuse him of murdering the great Qasem Soleimani, the Iranian slayer of U.S.-funded and backed terrorist. But they won't accuse him of that because that's just policy-as-usual for the U.S. empire. They won't accuse Trump of trying to overthrow the government of Venezuela simply because that is what the other administration would've been doing as well. Trump isn't being accused of any of the serious things he could be tried for simply because every other U.S. president has done the same, and perhaps worse. The trials against Trump are political in character, they are "lawfare" against a candidate that, while not some principled anti-imperialist, is an uncomfortable thorn for U.S. imperialism, even if it is only because of how unpredictable he is.

10. In recent days there have been demonstrations of rejection by citizens and also by important voices of culture. Can we sense a potential for resistance in the streets sufficient not only to contain and defeat Trump, but to unleash a process of real social and political transformations?

No. Some of the only protests I've seen have been around the issue of immigration. But this, as I mentioned above, is based purely on lies and media manipulation. I can't imagine it will take too long for the people protesting Trump on immigration to realize that he's actually far better on that issue than

8. Noam Chomsky, "The Crimes of U.S. Presidents," *Chomsky's Philosophy* (2003): https://www.youtube.com/watch?v=5BXtgq0Nhsc&t=114s

Biden and Obama were. There are many things to protest Trump for, but in the shock of the significant improvement he has made in U.S. policy, contrasted with the Biden regime, I highly doubt these will appear for quite a while.

If, as I argue above, Trump is really just pulling out of some of these conflicts so that he can focus on the 'big fish' to fry, that is, China, then I think we will get some strong resistance from the American people, especially the youth. With the temporary banning of TikTok a month ago, tens of millions of Americans flooded – purely to spite the U.S. political class – over to "Red Note," a Chinese lifestyle app.[9] There they were exposed to the truth about China, and had the lingering propaganda of the U.S. Deep State cleansed from their minds (at least for a lot of them). I don't think, after this "great migration" to Red Note, that the American people, especially the youth, will stand in favor of a belligerent attitude against China. If that is the course the Trump administration takes (and there are many in his government that want it to be so), then we will start to see people in the streets for something that actually deserves protests.

9. Carlos L. Garrido, "From TikTok to Rednote: The Dialectical Transition into Opposites," The China Academy (January 16, 2025): https://thechinaacademy.org/from-tiktok-to-rednote-the-dialectical-transition-into-opposites/

3

Crisis of Worldview: An Interview with Helena Sheehan

Helena Sheehan[1]

February 2025

RA: This year will mark the 40th anniversary of *Marxism and the Philosophy of Science*, a seminal encyclopedia of the history of the Marxist tradition's various interactions with the field. In the last four decades, what do you think have been the major developments in this relationship? How has the last decade's Engels revival, and the renewed interest in his *Dialectics of Nature*, affected this?

HS: 40 years! I hadn't quite realised. I felt somewhat isolated in the years when I was writing it, although I did manage to build a network of others within this tradition, mostly in Eastern Europe, but also elsewhere. I travelled to the USSR and other Eastern European countries and attended international

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1. Helena Sheehan is an American philosopher, historian of science, philosophy, culture and politics. Sheehan is professor emeritus at Dublin City University, where she taught media studies and history of ideas in the School of Communications. She is the author of Marxism and the Philosophy of Science (1985), and most recently, Until We Fall (2023).

conferences in US and Europe, but for long periods I was alone with it in Ireland. Once it appeared, there was a steady stream of people making contact with me about it, which accelerated quite a lot once the internet came into our lives. I have had quite a lot of email about it over the years, although the volume of it tends to rise and fall in line with the spikes of engagement with this tradition over the years.

Because this tradition was strongest in the socialist countries of Eastern Europe, there was a decline in work in this area after 1989. Many of the intellectuals who carried forward this tradition were cast aside and their institutions were abolished or subjected to hostile take-over. This was the lowest point for this tradition in those years.

In the past decade, there has definitely been a revival. I think the primary force driving it has been the ecological crisis and a rise of consciousness about the necessity of a philosophy of nature. For those who have pushed further, they have found an extremely rich intellectual tradition that put forward an integral philosophy that provided the philosophical foundations for the systemic thinking necessary for serious thinking about ecology. John Bellamy Foster and other authors in *Monthly Review* have played a major role in making this case. Foster has also gone back through the history set out in my book and stressed the ecological dimensions of it

At the moment, I am preparing for a keynote I am to give at a big conference on Marxism and ecology in Venice in March, where I am tackling these questions: Science and synthesis: Does late capitalism constrain the systemic thinking required by ecology? Does ecology demand a comprehensive world view? Is ecological crisis exacerbated by lack of systemic thinking? How does the prevailing social division of labour shape the production of knowledge? Is unity of science a meaningful goal? Can it be achieved without a grounding in an integral philosophy? What is the role of political economy in this scenario? Is Marxism the answer to these questions?

Back to the book, I see it as more than an encyclopaedic history of this tradition. It was an engaged and extended philosophical (and sometimes historiographical) argument defending this tradition and taking positions on various controversies within it.

One big controversy, of course, was that about the Marx-Engels relationship and the vast and vituperative anti-Engels literature that held sway in Western

Marxism. I am proud to have stood against this and I am happy to see the tide turn on this finally and to see Engels appreciated for the great thinker that he was. I am disappointed, however, that Kohei Saito has revived the Marx versus Engels position with his argument about a degrowth Marx versus a productivist Engels.

RA: In the text you argue that between the bourgeois extremes of subjectivism and fatalism, "the way out of the blind alley was dialectical materialism." How does Marxism, as a philosophical framework, provide insights into the nature and development of scientific knowledge? Why does it capture that which other philosophical worldviews miss? What value does Marxism bring to the philosophy of science?

HS: So many blind alleys, so many dualisms, so many contradictory positions are resolved within Marxism. The big one with respect to scientific knowledge is science as reliable knowledge of nature versus science as social construction of reality, which still divides science studies. Marxism has made the strongest claims of any intellectual tradition before or since about the socio-historical character of science, yet always affirmed its cognitive capacity, its revelatory power in explaining the natural world. Science was seen as inextricably enmeshed with economic systems, technological developments, political movements, philosophical theories, cultural trends, ethical norms, ideological positions. It was also a path of access to the natural world. There have been many studies, texts, theories, tensions, debates exploring the complexities of this stance. The objectivist/constructivist dichotomy could never capture its epistemological dynamic. Nor could the internalist/externalist dualism ever do justice to the interacting field of forces harnessed in its historiographical process.

What Marxism brings to philosophy of science is an integral philosophy. The mainstream western tradition, from positivism through neo-positivism to post-positivism is narrowly methodological. Marxism takes these methodological issues seriously and takes a position of critical realism. I am not referencing Roy Bhaskar here and I resent the way this concept has been branded to him. It has been the mainstream Marxist position from Marx and Engels until now. It sees knowledge as an interaction between mind and world which is capable of revealing the world. However, Marxism goes beyond this and aims to analyse the actual results of science in terms of weltanschauung. Many of those involved in this tradition were scientists, such as Bernal, Haldane, Needham, Levins, Lewontin, who reflected philosophically on

science and drew philosophical conclusions from science. Also thinkers, such as Marx, Engels, Lenin and Bukharin, who were not scientists, were constantly studying actual science and drawing philosophical conclusions from it.

RA: What was the importance of the 1931 International Congress of the History of Science and Technology in London? How did it influence the intellectual scene in the British communist movement? What role does it play for brilliant British progressive/communist scientists such as J.D. Bernal, J.B.S. Haldane, Joseph Needham, et. al.?

HS: In 2006, there were a number of international events organised by mainstream universities (such as Princeton) and professional bodies (such as the British Society for the History of Science) commemorating 75 years since that conference. How many conferences have been so memorialised? Who knows what happened at the first or third International Congress of the History of Science and Technology? It is only the second one that is remembered and not only among Marxists.

It is because it was the first time that a Soviet delegation appeared an international conference and that created quite a stir. However, it was much more than that. These were among the most renowned and creative intellectuals in the world at that time: Bukharin, Hessen, Vavilov and others too. They came full on, brimming with energy and confidence, making the strongest possible claims about the superiority of Marxism vis a vis all other modes of thought. It stunned the British audience, most accustomed to a much more low key and low claims mode of discourse. However, for others, who were already moving in this direction, it set them on fire. Already internationally renowned scientists, Bernal, Haldane, Needham and others focused on how a Marxist analysis of science was the key to a unifying vision connecting the disparate sciences. They also saw it as connecting science to other disciplines, such as political economy, putting forward a strong analysis of the role of science in capitalism, arguing that capitalism constrained science and it could only reach its full potential under socialism. Moreover, they built a movement for social responsibility in science. Today's Science for the People would be their successors.

RA: In your forward to Lenin's *Materialism and Empirio-Criticism*, you reference a thread on the text that you read online, which described "the text as the equivalent of garlic to ward off vampires, such as postmodernism or queer theory, which generated a series of varied responses, with some insisting that Lenin demolished the essential premises of postmodernist solipsism before its

proponents were even born, with others questioning this from different angles." Do you think this is correct? What tools did Lenin give us in this text to help us fight against the development of postmodernism, which has dominated Western academies for more than three decades?

HS: I cited it as an amusing, if hyperbolic, formulation. I think we need to look at Lenin's philosophy as a whole and not just this text, where there were some one-sided formulations, which were re-balanced in his later texts. The important thing about Lenin in this regard was his philosophical and scientific seriousness, his insistence on seeing the integral connections between science, philosophy and politics, his assertion of materialism and realism as the only sound grounding, both for the advance of knowledge and a movement toward socialism. We need, however, to make our own arguments for our own times and not to wave garlic or texts at those unbalanced by postmodernism and id-politics.

RA: Western Marxism has developed a profound, postmodernized, distaste of anything that appears as a 'grand narrative.' Some of the most prominent Marxists in the West today lament how, somewhere along the way, Marxism became a "worldview," a *weltanschauung*. Meanwhile, leading Chinese Marxist scholars, and even Xi Jinping himself, are constantly referring to Marxism as a worldview, and suggesting ways in which Marxist philosophy could fruitfully interact with various fields. Why do you think such an aversion to thinking about Marxism as a comprehensive worldview has developed in the West? What is at stake in sustaining Marxist philosophy as an all-encompassing worldview?

HS: There is finally a real push-back against Western Marxism now, although it is far from gone. Postmodernism is still there in the universities and wider culture. Although the debate about it, which raged in the 1980s and 1990s, has died down, its presence persists, often unnamed, in contemporary mentalities. It is rooted in the fragmentation of contemporary experience. This has also infected Marxism. Yet I think the tide has turned on it, at least within Marxism. History is moving so fast, with such big world-historical events to conceptualise, people are seeing the necessity of a grand narrative to frame it all and to live and think coherently within it.

In China, there is whole different atmosphere. There is a sense of a society moving forward and not plunging downward. There has been a revival of interest in Marxism under Xi Jinping. I was teaching at Peking University last

autumn and I am going back to do so again. I spent a lot of time talking to young people about their lives, their hopes, their views on China and Marxism. They do see it as a comprehensive world view and are sometimes a bit puzzled by assertions to the contrary in the west.

There is a massive crisis in meaning in the capitalist world. There is a crisis of vision, of values, of purpose. It is a crisis of world view. This is what Marxism has to offer: meaning, purpose, values, world view. Moreover, we offer a movement to transform the world that is plunging downward to destruction into one that is moving forward with vision, meaning, purpose, values, all grounded in a comprehensive world view.

4

Capitalism In Terminal Decline and the Economic Necessity of 'State Monopoly Socialism'

Ted Reese[1]

Headline points

• The aggregate ‘world’ rate of profit trends historically towards zero, having fallen from an estimated average of 43% in the 1870s to 11% in the 2010s.

• Rates of interest (a form of profit) over the past seven centuries have also trended towards zero, where short-term central bank rates were stuck for most of the period between 2009 and 2021 – record lows in both the US and UK, the

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1. Ted Reese is a British Marxist in the tradition of Henryk Grossman. He is the author of End of Capitalism: The Thought of Henryk Grossman (2022) and Socialism or Extinction: Climate, Automation and War in the Final Capitalist Breakdown (2019).

traditional capitalist superpowers – but ending recessions requires an average 6% baseline cut in order to cheapen capital and reincentivize investment.

• Prices have also closed in on zero – at exponential pace as, amid accelerating innovation, productive output tends to double absolutely every 25 years.

• The US dollar and UK pound sterling have lost nearly 100% of their purchasing power over the past century, mostly since 1970 when absolute productivity gains accelerated with automation and digitalization.

• The number of publicly listed US companies has more than halved since the mid-1990s and, since 1960, the average lifespan of the richest 500 has fallen from above 60 years to below 20.

• Whereas the capitalist class is a relatively dwindling minority, the global working class since the 1950s has been growing exponentially, making 'bourgeois democracy' increasingly obsolete and 'proletarian democracy' increasingly necessary.

• Fossil fuels are becoming too expensive to produce profitably due to dwindling ground reserves and ever-deeper drilling.

• To offset falling profitability, by economizing and rationalizing production, capital accumulation is increasingly dependent on central planning *within* and mergers *between* private enterprise. A 'final merger' – a necessarily public monopoly since no exchange of ownership would exist – with central planning of the economy *as a whole* and *social* accumulation is consequently becoming an economic necessity *for the first time*.

Karl Marx regarded socialism's supersession of capitalism as an inexorable natural process. Nuclear war, global warming or pollution-induced infertility could of course intervene; but the point is that capitalism tends to drive us closer and closer towards the necessity of implementing a socialist (publicly owned) mode of production. That's because, in the simplest terms, expanding and speeding up the production of commodified use-values (exchangeable useful products produced for profit) inevitably results in the ever-greater withering away of the exchange value (essentially labor time realized as profit at the point of sale/exchange) that commodities contain – eventually making exchange of ownership and the dual character of the commodity obsolete and necessitating a system of production based solely on (de-commodified) use-values. As

man-supervised automation tends to replace man-operated mechanization, not only as a result of the human inclination to innovate but to meet the ever-rising demands of capital accumulation by enhancing the productivity of labor – accelerated by competition between capitalists – the labor time needed to produce a commodity is disappearing and the capitalist productive and social system is quite clearly becoming ever more unmaintainable and crisis-prone.

Only purposeful human activity can ultimately bring this movement of history to fruition, but it is compelled by unavoidable economic developments. If we are conscious of this objective historical momentum, we can implement the necessary 'solution' and at least minimize the political and social conflict and turmoil that is bound up with such a transition. If we remain blinded by alternative proposals to 'reform' capitalism or attempt to skip ahead of what is practically possible, the transition to socialism will be all the more painful and the risks of the worst-case-scenarios prevailing will increase.

By analyzing short- and long-term empirical economic trends, a set of compelling evidence comes together to indicate that capitalist production is both approaching a *final, insurmountable* breakdown; and *evolving towards*, *birthing*, socialism. Capitalism, after centuries of evolution, is an increasingly *centrally planned state monopoly capitalism,* since capital accumulation is increasingly dependent on: the efficiency of central planning *within* each private enterprise (eliminated internal departmental competition; centralized real-time data; etc.); industrial monopolization through mergers and acquisitions; *and* state (public) subsidies, facilities and contracts.

Capitalism's evolution is therefore culminating in laying the basis of a *centrally planned 'state monopoly socialism'*, whereby a 'final merger' of evermore concentrated private enterprise *into a public/state monopoly* – since no exchange of ownership is necessary in a total monopoly – is the next necessary shift in the evolution of the productive forces (man and technology).

Long-term indicators

The 'world' rate of profit (the over and above return on investment) fell in an estimated secular trend from 43% in the 1870s to 17% in the 2000s, in one study;[2] and around 10-11% in the decade following the 'Great Recession' or

2. Maito, E., *The Historical Transience of Capital: The Downward Trend in The Rate of Profit Since XIX Century*, Universidad de Buenos Aires, 2014.

'Great Financial Crash' (GFC) of 2007-09, in another.[3] While the exact numbers differ across many other national rate of profit studies, the consistency of the trends confirm "the law of a *progressive* fall in the rate of profit"[4] (our emphasis) that Marx calls "in every respect the most important law of modern political economy".[5] Short- and long-term rates of interest (a form of profit) have fallen in a secular/historical trend towards zero *over more than seven centuries – regardless of the forms of political and banking regimes*.[6] Inversely, the trajectory of absolute 'global Gross Domestic Product' (in monetary value) veers *ever steeper, indicating an approaching peak*.[7] That is, as capital accumulates, rates of profit tend to fall.

The post-recession recovery from the GFC has been the weakest, relatively, since WWII. Whereas US GDP grew by 43% over the first 39 quarters of the 1991-2001 expansion, in the first 39 quarters of the expansion up to March 2019, it grew by only 22%. At that rate, the latter would have had to continue for another six years to equal the aggregate growth of 1991-2001, and nine more to match the the 54% recorded in 1961-69.[8]

Average GDP growth rates in 'high income countries' fell from 5.59% in the 1960s; to 4.15% in the 1970s; 2.93% in the 1980s; 2.35% in the 1990s; and 1.78% in the 2000s (World Bank). A rise to 2.1% in the 2010s – based on 'austerity' (the transfer of public funds into private subsidies), a temporary boom in shale gas discoveries, and record levels of debt – gave way to a 4.5% slump in 2020, even worse than the decline of 3.2% in 2009.

The *rate* of labor productivity growth (the monetary value each employed person creates per unit of input) in advanced countries has trended downwards. Growth in output per hour slowed in the US in 2015 to 0.3%, well below the average pace of 2.4% in 1999-2006.[9] Investment growth and the *rate* of innovation have also continually slowed down. Returns on US research and

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3. Basu et al.., "World Profit Rates, 1960-2019", University of Massachusetts Amherst, 2022. (See also Roberts, M., "A World Rate of Profit: important new evidence", The Next Recession [online], 22 January 2022.)

4. Our emphasis. Marx, K., *Capital Vol. III*, Penguin Classics, 1991 [1894], p. 319.

5. Marx, K., *Grundrisse*, Penguin Classics, [1939], 1993, p. 748.

6. See Schmelzing, P., (2020), "Eight centuries of global real interest rates, R-G, and the 'suprasecular' decline, 1311–2018", BankOfEngland.co.uk, p. 40.

7. "Global GDP over the long run", ourworldindata.org.

8. Hart-Landsberg, M., "Portrait of the 2009-2019 US expansion", *Monthly Review Online*, 20 June 2019.

9. Analysis of Conference Board data by Sam Fleming and Chris Giles, "US productivity growth slips for first time in three decades," *Financial Times*, May 26, 2016.

development (R&D) fell during 1985–2015 by 65%, despite a 250% rise in the number of scientists and engineers engaged in R&D.[10]

These productivity trends have 'coincided' with the 'deindustrialization' of the global workforce, now largely based in services, as automation – which does not require breaks or expenses on wages, lighting, heating, or holiday or sickness pay – takes over manufacturing. Even sub-Saharan Africa and Latin America spent the 2010s deindustrializing.[11] Just as the number of slaves in the US declined as a percentage of the population (from approx. 25% in 1790 to 16% in 1860) *before* slavery was abolished; manufacturing workers declined as a percentage of the US workforce from 26% in 1970 to 8.5% in 2016.[12] Through closures and mergers, a*lmost half*, 43%, of around 9,000 banks in the US 'disappeared' in 2000-17 – already down from 14,000 in 1986 and 30,000 in 1921. US savings institutions are also dying out, declining from around 4,000 in 1985 to 627 in 2020.[13]

Despite decades of privatization and absolute productive expansion, the number of publicly-listed US companies fell from about 8,000 in 1996 to 4,500 in 2016 and 3,700 in 2022. Some 52% of S&P 500 companies – the richest 500 on the US stock exchange – also 'disappeared' during 2000-15.[14] Since 2008, mergers and acquisitions in China – now challenging the US for the highest share of global GDP – have risen exponentially.[15] Of seven major merger and

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10. Knott, A. M., "Is R&D getting harder, or are companies just getting worse at it?" , HBR.org (Harvard Business Review), 21 March 2017. "Investment-specific technological change" has been marked by a "considerable slowdown" since 2000. Elsby, M., "The decline of US labor share", Brookings Institution, 2013, p. 31. See also, Roberts, M., "The productivity crisis", 30 May 2021.

11. "Premature deindustrialization in the developing world", Dan Rodrik's Weblog, 12 February 2015. While 'offshoring' manufacturing jobs – investing overseas/exporting capital to cheapen and expand the labour base – to the 'medium/low-income economies' saves up to 65% on labour costs, replacing human workers with robots saves up to 90%. ("Robot revolution: rise of 'thinking' machines could exacerbate inequality", 5 November 2015.)

12. See "Population of the United States, 1790-1860," ncpedia.org; and "Manufacturing jobs as a percentage of total US workforce since 1939: chart", topforeignstocks.com, 22 December 2016.

13. "Why does the US have so many banks? Thank Thomas Jefferson", uk.finance.yahoo.com, 8 April 2023; "Number of banks in the US – how many are there?", MoneyCrashers.com, 25 May 2023.

14. Tumerkan, A., "Corporate cannibalism: How monopoly powers are widening inequality", SpeculatorsAnonymous.com, 2 September 2021; K Garelli, S., "Why you will probably live longer than most big companies", IMD.org, December 2016. The number of companies listed on the UK stock exchange fell from 2,415 in 2008 to 1,646 in 2021. In Argentina the number fell from 321 in 1975 to 85 in 2021.

15. Mergers in China rose from 16 in 2008 to 469 in 2020. Xiao-Ru Wang, "A reflection on China's merger reviews – key messages from the latest five-year report and insights from

acquisition waves in the US since the 1890s, four (60%) have taken place since 1980.[16] Between 1964 and 2014, the average lifespan of the 500 richest US companies shrank from 61 to 18 years.[17]

Although each 'succeeding' generation has tended to have a higher proportion of investors (and thus 'semi-proletarians' – workers supplementing wages with investment returns), UK investors in 2023 were holding onto their shares for 0.8 years on average – down from 9.7 years in 1980, a decline of 91.75%. In the US the figure fell from five years in 1975 to 10 months in 2022.[18] From 1977 to 2013, startups as a share of all US firms fell from 16.5% to 8%, a decline pervasive across states and sectors.[19]

Despite higher educational attainment, fewer than 4% of US 30-year-olds in 2013 ('millennials') were 'entrepreneurs' (business founders) compared with 5.4% of those born in 1965-80 and 6.7% in 1944-62.[20] The same downward trend in entrepreneurship has taken place among older citizens of prime working age.[21] The capitalist is, evidently, a dying breed.
Of the roughly 750 currencies that have existed since 1700, less than 20% remain, all of which have been largely devalued.[22] British pound sterling has lost more than 99.5% of its purchasing power since its adoption as official currency in 1694. The US dollar has lost 97% of its purchasing power since

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economists", pymnts.com, 28 October 2021. State ownership (at least 51% of shares) of the wealthiest 100 Chinese enterprises increased from 31.2% in June 2021 to 54% in June 2024; although it fell slightly to 51% in December 2024. (Huang, T., and Veron, N., "China's share of companies in private sector saw small uptick in second half of 2024 after years of decline", PIIE.com, 8 January 2025.)

16. "United States - M&A Statistics", imaa-institute.org.

17. Garelli, S., "Why you will probably live longer than most big companies", IMD.org, December 2016.

18. *2020 Investing Statistics*, Finder.com/UK [online PDF]; Laidler, B., "The costs of rising short-termism", etoro.com, 9 February 2023.

19. Lettieri, J., "America Without Entrepreneurs: The Consequences of Dwindling Startup Activity", 29 June 2016. See also, "Start-up rates are declining across all sectors", HamiltonProject.org, 13 June 2018.

20. Nearly 40% of millennials (born 1981-96) have at least a bachelor's degree, compared to a quarter of baby boomers (1946-64) and 30% of Gen X (1965-80) when they were the same age. (Bialik, K., Fry, R., "Millennial life: How young adulthood today compares with prior generations", PewResearch.Org, 14 February 2019.) Overall, millennials earn 20% less than baby boomers did at the same stage of life. ("Millennials earn 20% less than baby boomers did – despite being better educated", CNBC.com, 5 November 2019.)

21. Tuttle, S., "Are millennials less entrepreneurial in the United States than past generations?", Suru Institute [online], 13 June 2018. The number of start ups led by young adults in 2014 were half of that compared to 1996.

22. Dalio, R., "Chapter 3: The Changing Value of Money", *Principled Perspectives*, 7 May 2020.

1913. The vast amount of that figure, 91%, ensued after 1949, when the US supplanted Britain as the world's dominant imperialist superpower (i.e., the world's dominant exporter of capital/owner of overseas investments). The figure since 1970 is 85% (93.5% for Britain), around the time of the first major post-WWII recession that catalysed the digital/computing/automation revolution.[23]

Costs of production have secularly trended towards zero.[24] Whereas the fastest supercomputer in 1975 was worth $5m ($32m in 2013 money); an iPhone 4 released in 2010 with the equivalent performance was $400. One gigabyte of data storage fell from $200,000 in 1980 to $0.03 in 2014.[25]

The production of 1kg of one type of protein molecule through 'precision microbial fermentation' – promising to exponentially augment the production of (chemically identical) animal and plant proteins for next to no cost, making 'conventional' intensive/industrial farming uncompetitive and obsolete (or at least unprofitable) – fell to around $100 in 2020 from $1 million (m) in 2000.[26] The energy return on energy invested (EROI) for oil trended downwards from 100:1 in 1930 to 25:1 in 1970, 10:1 in 1990 and 3-6:1 in 2019.[27]

With oil companies having to dig ever-deeper to extract oil and gas, the process is becoming more complex, expensive and capital- and fuel intensive. In 2019 the world burned 7.7 times more oil than was discovered. Explorers in 2015 discovered only about a tenth as much oil as they have annually on average since 1960.[28]

According to the International Energy Agency, oil production is declining at an average rate of 6.7% annually. Peak oil production struck in 2019, according to

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23. OfficialData.org.

24. Most long-term food commodity prices – barley, coffee, rye, corn, cocoa, tea, peanuts, palm oil, wheat, rice, sugar, and pork – have trended downwards since 1900. Beef and lamb started to go back up in the late 1990s, however. "Long-term food commodity prices since 1850", OurWorldInData.com.

25. "A history of storage cost", mkomo.com.

26. "Disrupting dairy with precision fermentation: 'By 2035, industrial cattle farming will be obsolete' ", FoodNavigator.com, 3 February 2020.

27. See Mearns, E., "ERoEI for beginners", euanmearns.com, 25 May 2016; "Energy Return on Investment", BuildingGreen.com, 11 January 2011; "Fossil fuels increasingly offer a poor return on energy investment", University of Leeds, ScienceDaily.com, 11 July 2019. A study led by French scientists published in 2021 claimed that by 2050 half of the energy extracted from global oil reserves will need to be put back into new extraction to keep producing oil, making the whole enterprise pointless. Dalannoy et al., "Peak oil and the low-carbon energy transition: A net-energy perspective," *Applied Energy*, vol. 34, 15 December 2015.

28. "Peak everything, overshoot, & collapse", Energyskeptic.com, 24 June 2020.

Shell. The shale gas/tight oil/fracking 'revolution' that (along with the debt boom) enabled (weak) US growth in the 2010s, also peaked in 2019.[29]

Between 2016 and 2020, the price of a barrel of crude averaged $51, but the cost of production in Saudi Arabia averaged $86. The value of Saudi Arabia's state assets, mainly in oil, is expected to fall from $900bn to (minus)-$2trn by around 2030.[30] Oil producers, highly dependent on public subsidies – no bottomless reservoir – have responded to waning profitability by imposing greater levels artificial scarcity (cutting production and/or distribution) than ever before, a strategy that already lifted prices by 70-80%.[31]

Fossil fuel has been vital for capitalism since the intensity and non-renewability of their production – it disappears into thin air once burnt – maximizes and renews the demand for labor exploitation and capital investment.

Near-term indicators

Restrictions on trade ('trade wars') have been hitting record levels since 2015 (*before* the election of Donald Trump or Britain's vote to leave the European Union).[32] In 2023, the first major US bank failures since 2009 included the *second, third and fourth biggest bank failures in US history*.

Whereas the number of bank failures during the GFC peaked at 297 in 2009-10, *722* US banks reported unrealized losses exceeding 50% of their capital at the end of the third quarter of 2022 and "face significant safety and soundness risks" (Federal Reserve). Losses on the US banking industry's investment

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29. US conventional oil production has been in absolute decline since the 1980s – even during the Great Depression of the 1930s it grew by 3.6% – when it started ramping up oil imports. In the 2000s the US imported around 75% of its oil, about 12-14 million barrels a day. Watch "Energy cliff: The coming depression that will never end", SRSrocco Report [YouTube], 24 November 2020. See also Brower, D., and McCormick, M., "What the end of the US shale revolution would mean for the world", FT.com, 15 January 2023; and Berman, A., "US oil dominance is coming to an end", 18 June 2020. The average annual shale production decline rate is 27%.

30. See "Saudi Arabia's oil problem", Wendover Productions, 23 September 2021 [online video].

31. "Revealed: oil sector's 'staggering' $3bn-a-day profits for last 50 years", TheGuardian.com, 21 July 2022.) In 2009, the G20 nations, which accounted for 79% of global carbon emissions, committed to phasing out fossil fuel subsidies in the medium term, but tripled subsidies for coal-powered plants during the next decade – making up for a 75% plunge in private investment. ("G20 nations triple coal power subsidies despite climate crisis", TheGuardian.com, 25 June 2019.) Globally, fossil fuel subsidies were $7trn or 7.1% of world GDP in 2022, according to the IMF – up by $2 trillion from 2020.

32. "WTO warns on rise of protectionist measures by G20 economies", FT.com, 21 June 2016.

securities totaled $690bn in the third quarter (Q3) of 2022 – around a quarter of all banking equity capital – compared to less than $100bn in 2008, at the height of the GFC.[33]

Global debt, substituting for the underproduction of value in commodity production, has continually hit record highs (driven by private debt) which trebled between 1950 and 2019.[34] The 'private sector' entered 2020 – before the COVID-19 lockdowns – with record debts, according to the International Monetary Fund, despite a decade of near-0% interest rates and record-high government bailouts that heaped much of its debt onto the backs of the public.

Official US national debt relative to GDP hit 126% in 2020, eclipsing the previous record of 119% *at the end of WWII*.[35] Having climbed *increasingly steeply,* the US's national debt (i.e., held by the public) exceeded $35 trillion (trn) for the first time in the second half of 2024; up from $23trn at the start of 2020; $9trn at the start of 2007; $17trn in 2013, $9trn in 2007; and $470bn in 1973.

In November 2022, the Bank of International Settlements (BIS, the 'Bank of Central Banks') warned that "mostly very short-term" geographically-hidden off-balance-sheet dollar debt held by financial firms had passed $80trn – exceeding the stocks of dollar Treasury bills, repurchase agreements and short-term corporate debt combined.
An unprecedented 'everything bubble' – whereby stock market capitalization (the total value of publicly-traded stocks) is overvalued relative to GDP – hit record highs after 2009, engulfing *every* asset/debt class *for the first time*, including (especially since 2020), long-term governments bonds.

It amounts to the third 'once-in-a-century' financial 'bubble' in three decades – the third to exceed the bubble that collapsed with the 1929 Wall Street Crash – following the 2000-01 'dot com bubble' crash and the 2007-09 'housing bubble' crash. What kind of bubble comes after an 'everything bubble' crash?

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33. Watch "Why is the Federal Reserve provoking a financial crisis?", BestEvidence (John Titus), 15 February 2023.

34. Mbaye, S., Badia, M., "New data on global debt", IMF.org, 2 January 2019.

35. TradingEconomics.com/Office of Management and Budget, The White House. When 'off-balance-sheet' debt is included – such as Social Security and Medicare; respectively estimated as on course to go bankrupt in 2026 and 2034 – US debt in 2019 was actually $103trn, 490% of GDP. That would put global debt at 560% of GDP; $215,000 per person (on average) instead of $86,000. (Surz, R., "Per capita world debt has surged to over $200,000", Nasdaq.com, 24 July 2019.)

The value of the Wilshire 5000, the total value of all publicly-traded US stocks, stood in January 2025 at a record high of 205.7% to GDP, beating the previous high of 193.4% in November 2021; the 160% in January 2020 that preceded the two-month 'covid/lockdown recession'; and the notorious peaks of 138.3% in March 2000 and 105% in October 2007.[36]

Whereas the bubble for the top 10 US technology stocks hit 30% of GDP in March 2000 before crashing to 6% by October 2002, the figure topped 56% in December 2021. In May 2023, the top seven tech stocks accounted for 86% of the S&P 500's year-to-date returns, having trebled their share of S&P 500 valuation from 8.4% in 2013 to 29.2%.[37]

The gigantic size of the bubble demonstrates that, for lack of profitable opportunities in commodity production, investment has been pouring into stock market speculation – where wealth centralizes into fewer hands via glorified betting, aiding the restoration of accumulation for the winners – *on by far the largest ever scale*.

The balance sheet of the Federal Reserve (the Fed), the US central bank, rocketed from $100bn in 2000, mainly then made up of investments in *short-term* government bonds (debt); to $900bn in September 2008, when, by digitally spending money 'into existence', the Fed bailed out banks by buying government debt lent to banks (mortgage-backed securities) and (*long-term* government bonds; to *$9trn* in 2020.

If that pace had continued, the Fed would "own the entire Treasury [government debt] market in about 22 months".[38] The US's M1 money supply (liquid monies such as cash) rose from $1.6trn in May 2009, to $4trn in February 2020, to $16.5trn in June 2020; and $20.7trn in March 2022.

The broader M2 supply (including deposits and money market funds) went from $8.4trn in June 2009 to $15.3trn in February 2020 and $22trn in April 2022. That meant *80.7%* of all M1 ever put into circulation was 'printed'

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36. See "The Buffett Indicator: Market Cap to GDP", LongTermTrends.net.

37. "7 or 493 stocks: What matters for the S&P 500?", Blog.Rangvid.com, 27 August 2023; "Just 7 companies are carrying the S&P 500 in 2023", SPGlobal.com, 18 May 2023.

38. "The Federal Reserve now owns 15 Percent of the US Treasury market; at its current rate, it could own the whole market in less than two years", WallStreetOnParade.com, 28 March 2020. In April 2020, the balance sheet of the G4 central banks (the US, Britain, Japan and the EU) collectively represented 40% of their GDP, up from 18% in 2010 and 30% in 2016.

(electronically spent into existence) in just 23 months; or 69.5% for M2 in 26 months.

For comparison, the total the US has spent on its wars on Afghanistan, Iraq, Syria and Pakistan since 2001 have cost $6.4trn.[39] The Fed started to operate at a loss in October 2022 – with its long-term assets fixed at lower rates but its short-term liabilities (money owed) burdened by rising interest rates (a result of falling private investment) – putting it on course to have negative tangible equity (liabilities exceeding assets) *for the first time*. That meant the Treasury stopped receiving the Fed's surpluses, a $100bn+ annual revenue source – four times the annual budget of NASA.[40]

The US government's interest payments on borrowing rose from 8% of government spending in 2019 to 13% in 2023; making it the fastest growing component of the federal budget. As investment falls and fixed rates of interest expire, this figure will continue to rise. The tax base, which private enterprise is increasingly dependent on for subsidies, is therefore tending towards collapse. A 1% rate of interest on £30trn of national debt is $300bn, but 10% is $3trn – not much less than total US tax revenues of $4.9trn in 2022, already short of the $6.27trn in government spending.

By September 2023, the 'gold standard' inverted yield curve – when the interest rate on the 10-year Treasury Bill (government debt) carries lower interest rates than the usually less risky 3-month or 2-year – had been signaling a recession for a *record* 212 days straight. Historically, the longer a recession takes to start after an inversion, the more severe the recession is. As the US yield curve started to un-invert, it did so *in a unique way*. The yield curve has always un-inverted via short-term rates falling faster than long-term rates. *For the first time*, the yield curve flattened because long-term yields climbed faster than short-term rates.

The Fed's baseline interest rate hikes took *eight years*, peaking at 19% in 1980-81, to combat the inflation of the 1970s. Because of lower wages relative

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39. Crawford, N., "1 United States Budgetary Costs and Obligations of Post-9/11 Wars through FY2020: $6.4 Trillion", 13 November 2019.

40. The Australian, Dutch and Swiss central banks also reported large operating losses. N.B. Cancelling a government's debt to its central bank is not much of an option. Firstly, as then BoE governor Andrew Bailey pointed out, government borrowing from the central bank cannot be cost-free, since the latter is still paying interest on reserves ("BoE is financing UK's coronavirus measures, Bailey acknowledges", *The Financial Times* [online], 14 May 2020.) The factoring-in of future debt repayments in spending plans, moreover, helps to hold back inflation. As of September 2023, the Federal Reserve was paying interest of 5.5% on reserves of $3.2trn.

to household debt levels, interest rates of 3% in Britain in 2022 were the equivalent of 14% in 1980.[41]
Overall real wages (adjusted for inflation) fell globally in 2022 for the first time since comparable records began (International Labor Organization). The US in early 2022 saw the fastest ever decline in job openings (excluding the lockdown shock).[45]

The medium real revenue growth of 'FAANG' stocks – Facebook, Amazon, Apple, Netflix and Google, the five best-performing US tech companies of the 2010s, comprising about 20% of the value of the S&P 500 – turned negative in 2022 *for the first time*.[42] 2022 was the worst year for stocks and bonds combined since 1871. Long-term US government bonds saw the biggest drop since 1788. The classic investor blend of bonds and equities put in the worst performance since 1932. In 2023, the Bank of America said losses on bond sales over the previous three years had been the worst over an extended period *in US history*.

In October 2022 the US started the largest-ever emergency release of oil from the Strategic Petroleum Reserve (SPR), which fell to a 38-year low of 21 days, then 17 a year later, down from 40 in 2020; and 350 million barrels, below half of the 2011 peak. The 283 million barrels sold took 25 years to accumulate. The rising costs of reproducing US military power has seen its naval and airforce capacity consistently diminish. The number of its heavy bombers has fallen to 140, from 400 in 1989; and navy ships from 600 to 292; while many of those that remain are operating well past their sell-by date.

The central bank baseline interest rate in the US and Britain hit 0% for the first time ever in the wake of the GFC as the demand for capital rose as a result of recessionary devaluations, making capital cheaper to purchase. The average Federal Reserve interest rate cut during recessions between 1958 and 2009 has been 6%. Since the 1980s, each US recession has started at a lower baseline rate – 19% in 1981, 8% in 1989, 5% in 2000, 4% in 2008; 1.5% in 2020. How negative could central bank rates go before lending is dis-incentivized? Rates are therefore likely to trend back upwards as capital investment plummets, making accumulation increasingly dependent on dispossession, accelerating the centralization of value and capital into the hands of an ever-slimmer minority.

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41. Conway, E., "Rising interest rates are a bigger deal than you might think", EdConway.com, 22 September 2022.

42. "A vicious stagflationary environment", Crescat.net, 25 August 2022.

The Revolutionary necessity of 'state monopoly socialism'

Empirical long-term economic data indicates that *world* socialism is becoming an absolute economic necessity *for the first time*. Socialism has grown within the womb of capitalism itself; just as capitalism emerged within feudalism through the evolution of material production and society's economic-technical basis. Accumulation, which can be defined as the quantitative and qualitative improvement of production itself, historically now demands that *social* accumulation usurp capital accumulation.

The *evolution* of society's economic-technical basis, from mechanized commodity to automated use-value, increasingly demands a *revolution* in the political-legal superstructure. Stimulated by the attacks of the capitalist class, increasingly desperate attempts to offset falling profitability (on wages, living standards and peace) the exponentially growing working class will be increasingly *compelled* to take up a revolutionary struggle to take over the ownership and control of production and establish a new all-socialist state that usurps the old all-capitalist state. Through ongoing struggle (including, to minimize conflict as much as possible, the expropriation of the last capitalists via compensation and long-term debt payments),[43] the socialist state will increasingly take production and services under public ownership until a total public monopoly of the economy is completed.

The establishment of the new *relations* of production from private to public/social/human *ownership* of production will represent a *social revolution;* and a culmination of an ultimately inseparable series of evolutionary phases and epochs not only during centuries of specifically capitalist production but thousands of years of privately-owned production comprising slavery, feudalism and capitalism.

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43. Arguably this is already happening, given China's overseas investments by *state-owned* enterprises.
All modes of production end partly via compensation for the 'old masters' – who, in trying to cling on to their property and power, tend to be the most rebellious and reactionary, *initiating the class struggle* – to limit social conflict as much as possible and to conquer a peace. The British capitalist state only finished paying off long-term debt to families of former slave owners in 2015. When feudal lords returned from the Crusades – wars driven by the economic need to expand land ownership – they would often be so broke that they would accept offers from peasants buying lands.
With contemporary weaponry being what it is and in the context of the climate/environmental crisis, expropriation via compensation is a more important policy than ever. Given the massive productivity gains to be made, paying long-term debt should prove to be relatively easy, although 'taxes' will of course be impacted, particularly initially.

Given that evolutionary phases are regulated by productive development and are therefore relatively gradual and cannot be 'leapt' over. The economy cannot be taken under public ownership in one fell swoop – the evolution of the productive forces (man and technology) now demands that 'state monopoly capitalism' is transcended by 'state monopoly socialism':

Because capital accumulation is increasingly dependent on *i)* mergers/monopolization; *ii)* central planning (eliminated internal markets, centralized data, etc.) and *iii)* state (public) subsidies, contracts and facilities;[44] a 'final merger' (a therefore public monopoly since no exchange of ownership is required) and central planning of the economy *as a whole*, is becoming, *for the first time,* an economic *necessity*.[45]

The private sector is losing its ability to employ value-creating (commodity-producing) labor, it does so only if profitable, (public) society, via the state and state/social enterprise, must take over responsibility for employment; enabling actual full, formal employment (thereby revitalizing earn-as-you-learn apprenticeships and retraining for workers displaced by innovation).

Money is dying a natural death, with physical cash also becoming obsolete through digitalization, it must be phased out and replaced by an *inherently* centralized non-transferable digital voucher credit system; with the 'currency' pegged to labor time, weighted against productivity rates and supply and demand. Work of 5.5 hours earns, on average, for example, 5.5 credits that can be used to draw down entitlements ('purchase' goods and services) that take, on average, 5.5 labor hours to produce; with prices adjusting upwards with higher demand relative to supply and vice-versa to ensure break-even production and price stability.[46]

Because vouchers are non-transferable, cancelled like train tickets once 'spent', the centralization of wealth into fewer and fewer hands is impossible. The most

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44. Private spending on research and development (R&D) has consistently declined to the point that in the US private R&D labs have "mostly disappeared", making corporations dependent on state-military R&D (Mazzucato, M, *The Entrepreneurial State*, Penguin, 2018, pp. 31, 193).

45. We use the term 'necessity' not in a deterministic but *relational* way. Marx's understanding of the *immanent* (inherent) movement of matter – confirmed by contemporary quantum physics – is that it is *part random* and *part relational;* so each movement relates to the one that came before, and so although the motion of matter is *indeterminate*, it is to some extent limited by that previous movement.

46. See Reese, T., "Fiat currency is dying a natural death – its logical replacement is a digital voucher system fixed to labour time", grossmanite.medium.com, 21 February 2020.

productive workers and those whose services are in highest demand relative to supply will still receive the highest pay, but as time goes on a larger proportion of workers will join the ranks of the most productive; and falling prices and accelerating innovation and productivity will progressively lift living standards for all.

The workforce is now almost entirely services-based and services workers produce relatively little new value per commodity, since they tend to handle, if any, finished or near-finished commodities.

Stable economic growth can only be established by an applicable system, whereby 'value' (measured in labor time as an accounting measure) is created not by anarchic (recessionary, competitive), for-profit commodity-production; but by planned (joined-up, coordinated), break-even utility-production.

Because the process of 'globalization', the global integration of production and distribution, is increasingly interrupted by capitalism's worsening breakdowns, its completion necessitates world socialism, making 'trade' *actually free* (again, since no exchange of ownership takes place between social enterprises) – necessitating a new Communist International, made up of democratic socialist republics to co-ordinate global co-operation.

Higher/stateless communism

Once the transitional socialist state has taken the whole economy under public ownership, the state will have been abolished, since the state is by definition the rule of one class over another – in the case of a transitional socialist state, the rule of the working class over the remainder of the capitalist class. This process is unlikely to be a linear one. As experienced in the past, there may be spells where isolated socialist countries or blocs need to allow partial re-privatization in order to evade sanctions, import resources, and build up foreign reserves. Once, however, the whole economy is publicly owned (ultimately globally) class has technically been abolished. A governmental structure remains, of course, but it no longer represents a state. Once the attitudes and actions of diehard counter-revolutionaries die out, the nature of the government structure should evolve in a way that requires less and less dependence on military and intelligence services.

Furthermore; as the productivity of social enterprise becomes increasingly prolific and prices fall back towards zero; new technologies like 3D printing

will diffuse (as has already largely happened with smartphones and laptops, for example) leading to increasingly abundant (extremely plentiful) material wealth *for all*, revitalizing independent craftsmanship along with creative, aesthetic and spiritual endeavors.

The relatively centralized, hierarchical authority of the communist governing structure – although it will be more hierarchical, even during the transitional period, will therefore tend to dissipate as dependence on social enterprise eases and previously economically weak peripheral nations, zones and regions become increasingly prosperous. So, *whereas capitalism has a long-term tendency to centralize wealth and power, socialism has a long-term tendency to decentralize wealth and power*.

Lower communism' evolves into 'higher communism', just as 'lower' 'mercantile/free market/competitive' capitalism evolved into a higher form, monopoly capitalism, which today has evolved into a *pre-socialist*, advanced state monopoly capitalism.

5

Principles of Biopolitical Economics

Pengpeng Liu[1]

0. Introduction

Every morning, as we wake up, our consciousness assures us that the self we are today is the same as the self that existed yesterday. Our life experiences solidify into memories, which then help shape and guide our future actions. Yet, there are times when we feel as though parts of our body don't "function as we wish." Could this be explained by the idea that parts of our body possess their own autonomous consciousness—one that might conflict with our collective consciousness (the overarching consciousness that defines us as human beings)?

Every human being lives and operates within various social organizations—families, companies, governments, nations, and more. As members of these groups, individuals often encounter situations where their personal ideas clash with the collective ideas of the group. Typically, what we call "collective awareness" or "team awareness" is articulated by team leaders.

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1. Pengpeng Liu is a member of the Communist Party of China. She got her PhD in organic chemistry from Balliol College, Oxford, in 2012-2016. In 2017, she returned to China to work in the pharmaceutical industry.

However, the individual awareness of these leaders cannot fully represent the collective consciousness of the group or team as a whole.

This raises an intriguing question: Could social groups—such as families, companies, communities, nations, and even humanity as a whole—be seen as unique types of organisms, each with its own autonomous consciousness? If we imagine a social group as "a person," there might be times when this "person" feels frustrated that some of its components (individual members) are not functioning as intended. Similarly, this "person" might occasionally act without clear purpose, leading to a life that lacks direction or significance.

Like all organisms and non-living matter, human beings are composed of elemental atoms found in the periodic table. Humans, other living beings, and inanimate objects all participate dynamically in the endless cycles of mass and energy in nature, adhering to the physical laws discovered by scientists. As humans, we possess our own consciousness. But what if we extend this idea further? What if the organs, tissues, and cells that make up our bodies each have their own consciousness? And what if all social groups, as well as the entirety of human society, also possess their own distinct consciousness?

0.1 Be illustrative, but not repetitive

> *To see a world in a grain of sand / And a heaven in a wild flower Hold infinity in the palm of your hand / And eternity in an hour*
>
> —William Blake, *Auguries of Innocence* (1803)

As modern natural science develops, humanity has formed systematic knowledge about how our body parts function inside us. Is it possible that the biochemistry laws concerning the function of our body parts, are illustrative to the research of the laws concerning the function of the human society? Is it possible that the laws concerning the function of the human society, are also illustrative to the research of the biochemistry laws concerning the function of our body parts?

From the perspective of philosophy, human being is consisted of body parts; human beings consist of human society. The natural laws existing in individual components (human being) would be illustrative to the probation of overall

system (human society) that the components construct; on the other hand, the natural laws existing in the overall system (human society) would also be illustrative to the probation of individual components (human being) that the system consists. However, it should be noted that the individual components and the overall system belong to different levels of sophistication in natural world: The discoveries of natural laws in one object could only be illustrative, but not repetitive, to the observations of another object.

Based on the arguments above, we propose the concept of "biopolitical economics".

0.2 Biopolitical economics

In biopolitical economics, human societies at all grades of hierarchy or sophistication are perceived as special organisms with their autonomous consciousness. Life science knowledge is attempted to explain the phenomena in the functioning of human societies. Meanwhile, the constituents of human beings and other organisms in nature are perceived as special societies with their autonomous consciousness. Political/economical science knowledge is also illustrative to the new findings in life science.

The main difference between "biopolitical economics" and "biopolitics"[2] (representative sociologist: Michel Foucault) is: Biopolitical economics performs comparison between the biochemical properties of human (and other species found in nature) and socio-political properties of human society; whereas biopolitics treats the biochemical properties as an important part of the socio-political properties of human.

0.3 Logical comparison

Our understanding of life has proceeded through to molecular levels. Back in early 20th century, our understanding of life had mostly stayed at the cellular levels. In metaphors, human beings are usually perceived as "cells in a country": But since the number of job types worldwide is at the level of tens of thousands; yet the number of cell types in a human being is about 200.[3] The metaphor "comparing human beings in the society to the cells in a human body" might be logically improper from the perspective of molecular biology.

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2. *Science* **2008**, *322*, 912-914
3. *PLoS Biol.* **2016**, *14*, e1002533

Human genomics predicts that the number of protein-encoding genes is around 20,000.[4] Proteins/polypeptides are the fundamental molecular machines fulfilling regulatory biochemical processes (In certain cases, RNAs take the roles instead of proteins/polypeptides in biochemical process). Thus, it might be more logically appropriate to perceive the relationship between a type of protein/polypeptide and an individual human being, as the counterpart of the relationship between a type of job holder and the whole human society.

According to the "one gene-one polypeptide concept",[5] the number of types of polypeptide that constitute human body is around 20,000: We could approximately perceive each type of polypeptide in human body as the counterpart of each type of job in human society.[6] Many proteins/enzymes consist of a single polypeptide chain and could function alone: We could perceive these types of proteins/enzymes in human body as the counterpart of self-employed jobs or simple jobs in human society. Some sophisticated biochemical processes involve many types of polypeptides (protein subunits) to cooperatively function according to the biochemical environment/signals (e.g. transcription in eukaryotes[7]): We could perceive these types of polypeptides/ protein subunits in human body as the counterpart of types of jobs fulfilling sophisticated projects in human society. Human immune system could generate huge amount of types of antibodies based on somatic VDJ recombination processes:[8] We could perceive the types of polypeptides generated from VDJ gene segments in human body, as the counterpart of the types of military jobs in human society; the types of antibodies in human body could be perceived as the counterpart of types of military deployment in human society.

After the long history of evolution, the species existing in nature are versatile. The species have their specific genome, which determines their specific proteomes that distinguish from other species. For different species, the constituting protein types, protein numbers, as well as the overall functioning complexity of the species, are all different. With regard to human society, after the long history of development, the economic entities in the world (most of which have the form of sovereign countries) are versatile. Different economic entities consist of different job types and different amount of population taking the jobs; also, the functioning complexity of the economic entities are different.

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4. *Hum. Mol. Genet.* **2014**, *23*, 5866-5878
5. *Genetics* **2004**, *166*, 1-10
6. List of over 12,000 jobs: https://www.careerplanner.com/DOTindex.cfm
7. *Nat. Rev. Mol. Cell Biol.* **2015**, *16*, 129-143
8. *Nature* **1983**, *302*, 575-581

For global economy or US/China, which covers (virtually) all the types of jobs existing in human society, the functioning complexity of these economic entities are very high. The functioning mechanisms of the species at higher sophistication level (e.g. eukaryotes) could be used to illustrate the functioning mechanisms of advanced economic entities. For other economic entities with lower levels of functioning complexity, species at lower sophistication level (e.g. prokaryotes) could be used as their illustrate.

0.4 Political standpoint of biopolitical economics

Biopolitical economics is a subject explaining the functioning phenomena of human society from the perspective of life sciences. Apart from biopolitical economics, there are many other types of perspectives to explain the functioning mechanisms of human society. Whichever type of perspective it is, its fundamental political standpoint would be either Marxism/communism, which is in the interest of working class; or, capitalism/imperialism, which is in the interest of exploitation class.

The political standpoint of biopolitical economics firmly locates in the area of Marxism. As an academic subject, biopolitical economics attempts to solidify the idea that communism functions as a vital component in human society development.

1. Basic Components and Function

1.1 Basic units of study

Molecular biology is essentially a subsidiary of chemistry; and chemistry is a subject on the study of molecules. The basic molecules that constitute life include proteins, nucleic acids, saccharides, lipids, etc. The major elements that constitute the molecules mentioned before include carbon, hydrogen, oxygen, nitrogen, phosphorous, etc. Proteins implement virtually all the critical activities of life. Nucleic acids carry genetic information of life and regulate levels of life activities. Saccharides are the direct energy source for life activities. Lipids could be categorized into two forms: a) The free form of lipids (e.g. fatty acids) is one of the important energy storage media in life. b) Biomembranes (fixed forms of lipid in coalition with proteins) build separate chemical environments in life, provide communication pathways in between, and offer critical conditions for biochemical processes. Apart from the molecules mentioned before, nutrients (e.g. water, molecular oxygen, dietary

minerals, vitamins, etc.) are the essential tools to guarantee the efficiency and accuracy of life activities.

Political economics studies the mechanisms of economic activities at any level of organization in human society. The people are the most important constituting factor in economic society, since they implement virtually all the critical activities in economic society. **We compare the role of people in economic society to the role of proteins in life.** Social relation in economic society is presented in the forms of labour division, social class, civilization, etc. The information carrier could either be tangible matters or non-material. In life, genetic or regulatory information is the "social relation" of the molecules related to life activities: **We compare the role of social relation (presented by labour division, social class, civilization, etc.) in economic society to the role of genetic information (carried by nucleic acids) in life.** Currency is the carrier of social resource that could be directly traded during economic activities. **We compare the role of currency in economic society to the role of saccharides in life.** After sophisticated economic activities, currency transforms into financial capitals, which have similar liquidity compared to currency, but function as the media for social resource storage. In the same time, financial capitals has connections with fixed forms of capitals via trading. **We compare the role of financial capitals (liquid forms of capital) in economic society to the role of lipids (free form) in life.** Means of production is the coalition between fixed forms of capital and the people (labourers). Similar to financial capitals, means of production are also generated by sophisticated economic activities. Means of production provide housing and shelter, allocate working place for people, implement production, and transport people/goods at high efficiency. **We compare the role of means of production in economic society to the role of biomembranes in life.** Natural resources such as water and minerals are the necessary tools for economic society to function. **We compare the role of natural resources in economic society to the role of nutrients in life.**

The comparison of the concepts in molecular biology and the concepts in political economics are summarized in Table 1-1.

Concept in molecular biology	Concept in political economics	Function
Proteins	The people	Implementation of critical activities
Nucleic acids	Labour division, social class, civilization, etc.	Information carrier of social relation
Saccharides	Currency	Carrier of direct resource flow
Lipids (free form)	Financial capitals (liquid forms of capital)	Resource convergence that can be stored or traded
Biomembranes (Fixed forms of lipid in coalition with proteins)	Means of production (Fixed forms of capital in coalition with the people)	Shelter, formation of specific environments, transportation, production
Nutrients	Natural resources	Necessary tool for function

Table 1-1 Comparison of concepts in molecular biology and in political economics

1.2 Proteins (concept in molecular biology) and the people (concept in political economics)

As the most sophisticated molecule in molecular biology, proteins bear the most versatile functions in life, which determines the fact that proteins are the pivotal constituent of life. The core activities of life consist of metabolism, transportation, signaling, gene expression regulation, recognizing and coping with other life-related molecules (aka. autoimmunity and immunity). Virtually all of the critical life activities are implemented by proteins. Although the definition of proteins has some kind of ambiguity, the number of types of proteins in human is around 20,000.

Economic society cannot exist without the activities of people, which makes the people the pivotal constituent in economic society. In economic society, the people bear versatile types of jobs. Farmers and industry workers produce products via farming or operating tools/instruments: **We compare the role of farmers and industrial workers in economic society to the role of enzymes**

in life. Merchants distribute resources inside and in between economic societies: **We compare the role of merchants in economic society to the role of transport proteins in life.** Public figures (e.g. writers and artists) and other messengers send out information or signals, which subsequently triggers downstream activities in economic society: **We compare the role of messenger people in economic society to the role of signaling proteins in life.** Administration people formulate policies and regulate economic activities in economic society: **We compare the role of administration people to the role of regulatory proteins in life.** Defence and security people recognize/confront hostile enemies and regulate public security by violence: **We compare the role of defence and security people in economic society to the role of (auto)immune-related proteins in life.** The definition of job types also has some extent of ambiguity. As said in Chapter 0, the overall number of job types in the world is in the range of 10,000~20,000.

1.3 Genetic information (concept in molecular biology) and social relation (concept in political economics)

In molecular biology, genetic information is carried by nucleic acids. Genetic information is sustained via the replication of nucleic acids. The accumulation of gene mutation leads to the formation or distinction of life species during the evolution in history. Transcription and translation of nucleic acids regulate the synthesis of proteins. For different life species, transcription and translation are influenced by more factors in more sophisticated species of life. In eukaryotes, the delicate relationship between transcription factors could effectively guide the specific living organism adjust gene expression levels according to the changes from exterior environment. Also in eukaryotes, introns in messenger RNA are deleted before translation, which lowers the probability of protein malfunction caused by gene mutation. These seemingly more complicated (or even surplus) procedures in life makes the species at higher sophistication more durable to errors/changes in nature.

In economic society, social relation is presented by labour division, social class, civilization, etc. Social relation is sustained by heritage and is mutated by revolution, which leads to the formation or distinction of versatile forms of economic societies during the evolution of human society. Social relation is the template that guides the development of people. Under the education and training from social groups (e.g. family, school, institutions, companies, etc.), and under the influences from civilization, people could effectively be involved in economic activities. For economic societies at higher levels of sophistication,

social relation (e.g. labour division, delicacy of the relationship between all types of economic activities in the society, etc.) would be more complicated compared to the ones at lower levels of sophistication. Meanwhile, economic societies at higher levels of sophistication would have more constituents that are functionally complementary (or even surplus) to each other, which would make the whole society more endurable to the changes or challenges from exterior environment.

1.4 Saccharides (concept in molecular biology) and currency (concept in political economics)

In molecular biology, one of the major functions of saccharides is to provide energy for life activities. With the chemical structure based on carbon chains, saccharides release energy via the break of C-C/C-H bonds and the formation of CO_2/H_2O during citric acid cycle. Saccharides are intensively involved in energy-related metabolism; yet in most cases, the masses of energy-providing saccharides only flow through life, but do not linger in life. Ribose and deoxyribose are the core structures of ATP, NADH, nucleic acids, etc., which are the pivotal molecules related to metabolism and gene regulation. The saccharides that exceed the energy demands of life activities would go through complicated pathways to form oligo-/poly-saccharides (short-term energy saving media) or free forms of lipids (long-term energy saving media).

In economic society, currency renders direct energy to economic activities such as commodity circulation and production. Currency is intensively involved in production, distribution, consumption in economic society; yet for a healthy economic society, the masses of currency only flow through it, but not linger in it. Currency is also an information carrier of social relation (e.g. labour division, classes, civilization, etc.): An economic society could convey part of its regulatory information through its currency policy.[9] The currency that exceed the demands of economic activities would go through complicated procedures to form short-term savings or financial capitals.

1.5 Lipids (concept in molecular biology) and capitals (concept in political economics)

1.5.1 Lipid in free forms and in biomembranes (fixed forms)

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9. For example, the words and pictures depicted in currency convey part of the mainstream ideology of the economic society.

In molecular biology, lipids in free forms often exist in the structures of fatty acids and glycerides. Similar to saccharides, lipids have the chemical structure based on carbon chains; yet lipids have higher energy density compared to saccharides because the oxygen proportion in lipid molecules is lower. Lipids (free form) could be obtained from exterior environment by digestion; they could also be obtained by synthetic pathways in life.

Fixed forms of lipids in biomembranes have very similar C-H chain structure compared to free forms of lipids; and both forms of lipids are media of energy convergence/storage. Yet lipids in free forms are short of phosphate groups, which render amphiphilicity to phospholipids (fixed forms of lipids). Amphiphilicity is the vital property of biomembranes: Being compatible with both water and oil makes biomembranes available to be effectively interact with proteins in many critical life activities. Meanwhile, biomembranes function as the frame of life: Biomembrane systems at dynamic functioning stage cannot easily participate in the catabolic procedures that lipids (free form) do. Only the biomembrane systems at apoptosis stage are susceptible to the aforementioned catabolic procedures, since the system is breaking down.

In summary to the discussions above, lipids have higher energy density compared to saccharides. Lipids (free form) are one step short compared to biomembranes (fixed forms of lipid in coalition with proteins), which function as the frame of life. Free forms of lipid are not freely interchangeable with fixed forms of lipid in biomembranes.

1.5.2 Capital in liquid forms (financial capitals) and in fixed forms (in means of production)

In economic society, financial capitals (liquid forms of capital) are media for social resource storage and have similar liquidity compared to currencies. Typical forms of financial capitals include but are not limited to payments, investments, financial derivatives, etc. Similar to currency, financial capitals are eligible to be traded in the market; yet their resource density is higher compared to currency. Financial capitals could be directly obtained from nature (usually through mining) or from other economic societies (usually through looting). Financial capitals could also be generated from currency through complicated economic activities.

Fixed forms of capitals in means of production have similar properties compared to financial capitals (free forms of capitals), as both forms are the

media of social resource convergence. However, the fundamental difference between financial capitals and fixed forms of capitals lies in that the latter forms are intensively in coalition with the people (labourers); whereas financial capitals only signify an assemble of resources in the market. For means of production that are at dynamic functioning stage, they form the frame of the economic society and cannot be freely traded in the market as financial capitals do. Only for the means of production that are at exit stage of market competition, their constituting fixed forms of capitals could be traded in the style similar to financial capitals.

In summary to the discussions above, capitals have higher resource density compared to currency. Financial capitals (liquid forms of capital) are one step short compared to means of production (fixed forms of capital in coalition with the people), the latter of which functions as the frame of economic society. Fixed forms of capitals in means of production are not freely interchangeable with liquid forms of capitals.

1.6 Biomembranes (concept in molecular biology) and means of production (concept in political economics)

1.6.1 Biomembranes (fixed forms of lipid in coalition with proteins)

In molecular biology, biomembranes exist in all life species that are constituted by cells. Biomembranes are formed through complicated biological pathways. They provide locations and channels for versatile life-related proteins, metabolites, and signals to guarantee life activities are properly, accurately and efficiently implemented. Biomembranes provide locations for functioning proteins either in/on the membranes themselves or in the regions that the membrane encloses. In the same time, biomembranes build barriers from the perspective of information (e.g. cellular antibody recognition), material (e.g. osmosis pressure) and energy.

For life species at higher levels of sophistication, biomembrane systems that constitute cells and tissues would have higher levels of complexity; the membrane proteins (with the function of recognition, transportation, etc) would also have more complicated relation networks and signal pathways.

For different organelles in a cell, different cells in an organ, different organs in a life, their respective distributions of protein, metabolites, energy flows and signal pathways would have significant discrepancies. Yet despite the

versatility, all the constituents (of the life species) share the same genetic information and conform to the same regulatory procedures that the species implements. Also, the different constituents have stable and reliable communication pathways with regard to information, material and energy.

1.6.2 Means of production (fixed forms of capital in coalition with the people)

In economic society, all economic entities are equipped with means of production. Means of production are formed through complicated social work which usually requires intensive labour division and cooperation between people. Means of production provides necessary shelters and locations of work for people; they also provide storage and transportation for social resources associated with economic activities. Means of production include tangible matters such as land territories and tools/instruments for production; they also include intangible matters such as intellectual properties. Both the aforementioned tangible matters and intangible matters function as the basis of barriers (aka. division of labour) in social activities.

For economic societies/entities at higher levels of sophistication, the constituting system of means of production would have higher levels of complexity; the social network of the people involved, as well as the network of social resource flow, would also be more complicated.

For an economic society with complex hierarchies, labour division makes the types of work and social resources strongly versatile in all levels of administrative divisions. For different types of economic entities in the same economic society and different departments in the same economic entity, the difference of the nature of means of production makes the communication mechanism between people much different. Yet despite the versatility, provided the entities constitute the same economic society, stable communication pathways between the constituents are critical in the fields of information, goods, human resources and financial resources. Also, economic entities at all levels of hierarchy conforms to the same system of disciplines in terms of law and morality; and they conform to the regulations implemented by their communal government.

1.7 Nutrients (concept in molecular biology) natural resources (concept in political economics

In molecular biology, all life forms require support from exterior resources to maintain their normal life activities. Water is the necessary solvent for

biochemical conversions; microminerals are catalytic centers for enzymes; vitamins are intensively involved in the critical steps in biochemical cascades. No life form could live without the communication with exterior environments: all species require exterior resources from other species and non-life. In the same time, the metabolites generated from one species could become the exterior resources of other species.

For economic societies, sufficient supply from natural resources is a necessity for ideal development of economy. Major cities usually locate near rivers or in the regions rich in natural resources: The water and minerals nearby are necessary resources for economic activities. No countries could function normally without the communication with exterior environment. The natural resources as well as industrial products from foreign countries are necessary for the economy to develop at normal conditions.

2. Implementation of Critical Activities

In this chapter, proteins (concept in molecular biology) and the people (concept in political economics) will be discussed in detail. The similarity of the two concepts had been described in Chapter 1: Proteins are the major role to implement critical activities in life; The people are the major role to implement critical activities in economic society.

2.1 Formation and function

2.1.1 Proteins (concept in molecular biology)

In molecular biology, proteins are formed from amino acids with the information from messenger RNA as template. The primary structure of proteins are the sequence of amino acids. Based on the primary sequence, folding and formation of disulfide bonds occur under ideal chemical environments: Secondary and tertiary structures are then formed. Some types of proteins consists of multiple subunits with either identical or complementary structures. For some types of proteins, post-translation modifications (e.g. glycosylation, methylation, phosphorylation, etc.) are required to guarantee the normal activity of proteins. The modification procedures are necessary in that the complex biochemical environments adjust the activity of proteins to ensure the overall system functions at optimal conditions as much as possible.

The mechanism of protein to function could be summarized into one word: Fit. Only the proteins with primary, secondary, tertiary structures that are best fit to

the biochemical environments, could function at optimum efficiency. The spatial conformation of proteins determines whether they could accurately recognize target molecules[10] or whether they could accurately fit metabolite molecules into catalytic centres. A medium-sized protein consists of several hundreds of amino acids: The change of any amino acid inside could dramatically alter the spatial conformation of the protein, thereby influencing the function of the protein.

After the long history of natural evolution, the proteins that constitute life would have high exclusivity in terms of structure and function. This guarantees the specificity of the species and the differentiation inside a specific living organism. Also, specificity and exclusivity guarantee the high efficiency in biochemical processes.

2.1.2 The people (concept in political economics)

In economic society, the people are defined by the attributes that the society renders. This means that in political economics, the study of the people should be backed by their social relation system. The people in economic society are created by versatile social relations such as family ties, education and employment. Some types of occupation require the intensive collaboration from multiple labourers (with either identical or complementary functions) to be successfully implemented. Some types of occupation require the support from monetary resources (to ensure that the job holder is sufficiently able to pay) to be successfully implemented. Some types of occupation require delicate adjustment of the efficiency of the job holders:[11] The working environment would adjust the output of each position to optimize the condition of the whole economic society/entity.

In economic society, the mechanism of the people to function could be summarized into one word: Fit. The creation procedure from social relation system determines the ability at all dimensions and fitness to the work positions of the people. For a specific work position, only at the right time, in the right place, with the right people, the designated tasks could be perfectly implemented. The education and training experiences of the labourers determine whether they could perfectly fit into the work position and fulfill the designated tasks. The seemingly trivial discrepancies between the social

10. Target molecules could be proteins, nucleic acids, lipids or any other signal molecules.

11. That is to say, job holders are not necessarily required to work at full efficiency all the time.

relation network of two people could lead to the fact that their work positions could not be interchanged.

After the long history of development, labour division in economic societies has reached to a rather sophisticated state. For a well-developed economic society or entity, the constituting work positions are highly versatile and have high exclusivity: This also guarantees the high efficiency during the work implementation procedures.

2.2 Energy sources

2.2.1 Adenosine triphosphate (ATP) is the energy source for eukaryotes

For most of the eukaryotes, the basic organelle to supply energy for life activities is mitochondrion. Mitochondrion provides biochemical environments for proteins related to aerobic respiration, generating the ATP used for life activities. Virtually all critical life activities[12] require phosphorylation or dephosphorylation processes related to ATP.

The upstream metabolites of ATP are saccharides and related nutrients. Saccharides undergo typical oxidation processes (e.g. citric acid cycle) to yield ATPs. Sufficient amount of saccharides and nutrients is only one of the necessities to guarantee full energy supply of life; the other deciding factor is the activity of proteins involved in the saccharide metabolism. According to the activity level of saccharide metabolism-related proteins, there should be a decent concentration range of sugar in a living organism. Sugar concentrations higher or lower than the range could both give negative effects. The detailed discussion on the role of saccharides in life will be presented in Chapter 4.

2.2.2 Food and clothing is the energy source of economic societies

For economic societies, we can never overestimate the importance of agricultural security. The role of agriculture in economic society is the counterpart of the role of mitochondrion in eukaryotes. The food and clothing produced from agricultural activities could keep people warm and free from hunger. This is the prerequisite factor before any critical economic activity[13] could be implemented.

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12. The critical life activities include but are not limited to: Gene replication, gene transcription and translation, protein conformation change in molecular recognition, metabolism-related enzyme activities, etc.

13. The critical economic activities include but are not limited to: Inheritance of social relation, creation of the people by education and training, division of labour & collaboration between labourers, usage of tools to implement production, etc.

In economic society, the upstream object of food and clothing supply is currency and natural resources. Under the decent supply of natural resources and currency circulation, food and clothing could be efficiently harvested and circulated in the economic society. Sufficient amount of natural resources and currency supply is only one of the necessities to guarantee full energy supply of economic activities; the other deciding factor is the productivity of the labourers harvesting and producing agricultural products. According to the productivity of the labourers in the economic society, there should be a decent amount of currency circulation in the economic society. Currency supply either in surplus or in deficiency could give negative effects. The detailed discussion on the role of currency in economic society will be presented in Chapter 4.

2.3 Regulation and defence

2.3.1 Immune system, immune cells and antibodies

Advanced forms of life need immunity to regulate the functions of constituting parts (auto-immunity) as well as to protect the living organism from the attacks outside (immunity).

Take human as an example for discussion. Human immune system is constituted by immune organs (thymus, bone marrow, lymph, spleen, etc.). Immune organs is constituted by tissue cells and in the same time generates specific immune cells (T cells, B cells, NK cells, macrophages, etc.).

At healthy state, life does not need to spare significant amount of resource to generate antibodies. All the immune cells function in a balanced style to keep the living organism organized. For killer T cells, NK cells and macrophages, they function in the unit of cells: These immune cells patrol and check functioning cells, and attack infected or cancerous cells. Helper T cells alarms the immune system that some cells are attacked by external microorganisms or some cells have become cancerous.

At the state of being infected by antigens, B cells are activated by the signals from immune system and generate large amount of antibodies, which consumes significant amount of resources from the living organism. Antibodies are essentially a team of proteins generated by the immune system to fight against invasions from external microorganisms. The major difference between antibodies and ordinary protein subunits lies in that the type of antibodies is highly versatile. Only by forming antibodies with sufficient amount of types

and by screening under actual combat conditions, life could keep the teams of antibodies that efficiently fight against antigens. Although the gene number related to antibody formation is as low as <100, VDJ recombination renders the antibody system with high versatility.

2.3.2 Institutions of violence, national defence and armed forces

Economic society needs internal regulations (aka. public security) to keep the society organized. Meanwhile, economic society needs national defence to protect itself from enemies.

Take Chinese institutions of violence as an example for discussion. Chinese institutions of violence include but are not limited to: Commission for Discipline Inspection System of Chinese Communist Party, People's Court System, People's Procuratorate System, People's Public Security System, National Security System, People's Liberation Army, People's Armed Police, etc. Of these institutions of violence, some are institutions of intelligence and can be referred for decision-making; some are institutions of execution; and some undertake both two duties.

In times of peace, armed forces are not involved in wars and thereby do not consume too much social resources. All the institutions of violence function in a balanced style to keep the economic society organized. As an example, Chinese domestic news often reports the anti-corruption activities by the team of Commission for Discipline Inspection System, People's Court System, People's Procuratorate System and People's Public Security System. Public security officers fight against outlaws to keep our daily life secure; National security officers fight against spies to keep the country safe and sound.

In times of war, armed forces will be summoned under war mobilization, which consumes significant amount of resources from the economic society. Armed forces are a team of soldiers to fight against enemies. Since the battlefield is constantly changing, whereas the ordinary workplace usually stays still, soldiers need to cope with the environmental change much more than the ordinary labourers do. As a result, the organization styles of armed forces are much more versatile compared to the ordinary economic entities.

2.4 Create, repair, decompose and dispose

2.4.1 Enzymes

The core activities of life is to create, repair, decompose and dispose of metabolites. These processes could be summarized as the metabolism of life. Metabolism is essentially a series of biochemical reactions and enzymes are the critical catalyst of the processes. Saccharide metabolism, as described in Section 2.2, requires relevant enzymes for the oxidation of carbohydrates and the release of energy. Apart from saccharides, for all of the critical molecules (lipids, nucleic acids, proteins) related to life, each life form has its specific metabolism pathways for the molecules. Molecules under anabolism pathways will be created and repaired; molecules under catabolism pathways will be decomposed and disposed of.

2.4.2 Occupations related to social production

The core activities of economic society is to create, repair, decompose and dispose of objects related to economic society. The objects not only include means of production and consumables; they also include the people in the economic society. As a result, the occupations related to social production are critical to economic activities. The production of food and raw materials of clothing (described in Section 2.2) is implemented by agricultural labourers. **The role of agricultural labourers in economic society could be approximately compared to the role of enzymes in saccharide metabolism.** Labourers in manufacturing and construction industry are involved in the social production of means of production and consumables. **The role of manufacturing and construction labourers in economic society could be approximately compared to the role of enzymes in lipid metabolism.** Administrative people embody social relation into detailed policies and rules. **The role of administrative people in economic society could be approximately compared to the role of enzymes in nucleic acid metabolism.** Teachers educate and train labourers; doctors heal labourers; lawyers defend the rights of labourers. **The role of teachers, doctors and laywers in economic society could be approximately compared to the role of enzymes in protein metabolism.**

2.5 Transportation

2.5.1 Transportation in life

The transportation in life could be studied at macroscopic scale and at microscopic scale. At macroscopic scale, the materials related to life activities are transported by blood, an organ with the function of transportation, among

the organs that constitute life. For different organs, the difference of their functions makes the differences of their inputs and outputs. At microscopic scale, the functioning procedure of a single cell involves versatile material transportation: Trans-cell membrane transportation fulfills the communication between cell and exterior environment; intracellular transportation fulfills the routine functions of the specific cell.

For small molecules such as water, salts and amino acids, their transportation could be completed by simple diffusion or by the active transport from transmembrane proteins. For large molecules such as saccharides, lipids and proteins, their transportation could be completed by vesicles specifically designed/formed for the "cargo": The vesicle is manipulated by its constituting protein and the targeted transportation is completed.

2.5.2 Transportation in economic society

The transportation in economic society could be studied at macroscopic scale and at microscopic scale. At macroscopic scale, the economic society usually has clear labour division at industry level. The materials related to economic activities would be transported between industries under the regulations from administrations and the market activities between industries. At microscopic scale, versatile transportation is involved in the specific economic entity: Transportation between the economic entity and exterior market fulfills trade deals; transportation inside the economic entity fulfills the routine functions of the economic entity.

For small items such as portable tools or portable goods, their transportation could be completed by individual labourer. For more important or larger items (such as currency, physical capitals, means of production, labourers themselves), their transportation could be completed by vehicles specifically designed/manufactured for the "cargo": The vehicle is manipulated by its driver and the targeted transportation is completed.

2.6 Signal management

2.6.1 Signal management in life

For a specific living organism, signals come from both external and internal environments. Signals from external environment include light, heat, odours, etc. Signals from internal environment include electricity from nervous system, hormones released by specific cells, etc.

The carriers of signals could be versatile: They could be a string of electromagnetic wave, a single metal ion, a short-chained polypeptide, or a protein molecule. Yet whichever the carrier form is, the critical role for signal reception and signal processing is undertaken by proteins. Typical examples include ion channel receptors, a series of proteins that undertake the role of neurotransmitters; and G protein-coupled receptors, a series of proteins that detect signals outside of the cell and activate cellular responses.

Signal reception triggers/activates the membrane protein and lead to a cascade of biochemical reactions that involves several other types of proteins. For the reception, transmission and processing of a specific signal, the type number of the proteins involved in the cascade reactions could range from 3 to more than a dozen. Meanwhile, the cascade biochemical reactions could split like branches, that is to say, a single signal triggers multiple biochemical pathways.

After signals are properly processed by the cell, the results could be versatile: Growth hormones could facilitate the proliferation of cells; signals from helper T cells could trigger the generation of antibodies by B cells; apoptosis signals could lead to the planned death of target cells.

If the signal management system of life functions normally, the chances of life encountering illnesses would be low. But since the environment that life lives in is dynamically changing and the evolution of life itself is far from perfection, any living organism would encounter the challenges of illnesses virtually at all stages of development. Take human as example, even after the long history of natural selection, its signal management system has many imperfections or shortcomings towards challenges. Pressures from work or daily life could lead to sleeping disorders; antigens from pandemic could lead to malfunctions of the immune system. As a result, the tissues/organs do not develop to the extent as properly planned; immune system mistakenly recognize normal cells as enemies, or cannot clear cancerous cells that are supposed to be eliminated, or cannot clear pathogens that would lead to infection; cells that are supposed to undergo apoptosis still dwell and consume resources of the body. Under these circumstances, illnesses at different levels of severity could occur. Treatment or precautions could be the solutions to the challenges from illnesses. Typical solutions include relieving pressures of life by lowering expectations, improving sleeping quality, taking the proper medicines: All of these solutions could effectively reallocate resources in the body and send the signal

management system back to normal state,[14] thereby reaching to the goal of being healthy.

2.6.2 Signal management in economic society

For a specific economic society, signals come from both external and internal environments. Signals from external environment include climate change, natural incidents, discovery of natural resources, etc. Signals from internal environment include policies issued from authorities, enquiries or demands or feedbacks from cooperating economic entities, etc.

The carriers of signals could be versatile: Natural environment send signals to the economic society by climate change such as temperature, precipitation and sunlight; news are released via radios, televisions and internet; a specific law or policy is issued and comes into effect; superiority sends a person to work in a specific department, leading to the change of functioning state in the department. Yet whichever the carrier form is, the critical role for signal reception and signal processing is undertaken by people working in the economic entity, the messenger people. In Greek mythology, Hermes is known as the messenger god, and has extensive and effective connections with people from all backgrounds.

Under normal conditions, signal reception would trigger a cascade of economic activities that involves several other types of occupations. For the reception, transmission and processing of a specific signal, the type number of the occupations involved in the cascade activities could range from 3 to more than a dozen. Meanwhile, the cascade economic activities could split like branches, that is to say, a single signal triggers multiple economic activity pathways.

After signals are properly processed by the economic entity, the results could be versatile: Policies that support the development of one specific industry could increase the number of the economic entities in the industry; information from intelligence departments could lead to the responses of national defence to counter the invasion or penetration from hostile enemies; policies that restrict or terminate the development of one specific industry could reduce the number of the economic entities in the industry.

If the signal management system of economic society functions normally, the chances of the economic society encountering problems would be low. But

14. That is to say, every body part is on the same page, and is all in the interest of the whole body.

since the environment that the economic society locates in is dynamically changing and the refinement procedure inside the economic society is far from perfection, any economic society would encounter challenges or obstacles from misinterpretation virtually at all stages of development. For human economic society, the signal management systems still have much discordance at all levels of constituting hierarchy. For example, an economic society faces social contradictions because of the incompatibility between productive forces and relations of production; chronic labour shortage could lead to the productivity failing to meet the demands of social needs; global pandemic could exacerbate social polarization and increase the rates of strategic misinterpretation. As a result, the constituting economic entities do not develop to the extent as properly planned; institutions of violence mistakenly judge normal constituting entities as adversaries, or cannot clear adversary constituents that are supposed to be removed, or cannot effectively counter the invasion or penetration from hostile enemies; economic entities that are supposed to cease to exist still dwell and consume resources of the economic society. Under these circumstances, social problems or conflicts at different levels of severity could occur. Typical solutions include adjusting social development expectations in accordance with current productivity, defending the rights of labourers, carrying out social revolutions at proper forms and intensities: All of these solutions could effectively reallocate social resources and send the signal management system back to normal state,[15] thereby reaching to the goal of healthy social development.

3. **Information Carriage and Embodiment of Social Relation**

Any object functions under rules: This also suits for either a living organism or an economic society. Apart from conforming to the same fundamental physical laws, various types life species (or economic societies) conform to the rules that are either in common with or distinctive from each other. Genetic information is the critical factor that distinguishes one life species from others: Genetic information regulates the function of life via transcription and translation to form protein systems. Social relation is the critical factor that distinguishes one economic society from others: Social relation is presented by civilization, culture, ideology, religion, political system, laws, moralities, etc., and regulates the function of economic society via embodying into people undertaking versatile types of occupations.

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15. That is to say, every constituting part of the society is on the same page, and is all in the interest of the whole society.

In this chapter, we compare the roles of genetic information in life, to the roles of social relation in economic society.

3.1 General genetic information and general social relation

3.1.1 General genetic information

For most life forms in the world, the genetic information carrier is DNA. DNA structure has advantages such as high accuracy in replication, high information density, and easy-to-obtain raw materials: After the long history of natural selection, DNA structure is selected as the genetic information carrier for most life forms.[16] All of the genetic information in life would undergo extensive natural selection, mutation, evolution in the long history of time, and develops under the influences of both internal and external environment. We could judge the kinship between two species by analyzing the similarities of the genetic information of the two species. We could also explore the evolution status (both spatially and historically) of the environment that life dwells in, by studying the genetic evolution status of the specific life. In a word, the general genetic information of life carries the historic and current information of its development. We could also predict the development status of one species by exploring the characteristics of its general genetic information and the characteristics of its external environment.

The general genetic information of life includes the information of all base pairs from all of the DNA molecules in nucleus, mitochondrion, etc. For many sophisticated life forms, part of the genetic information is retained in the life form but is not expressed any more. We define this part of the genetic information as non-coding DNA. Non-coding DNA has possible relations to historical evolution, and constitutes the general genetic information along with coding DNA (genes).

Despite that non-coding DNA does not directly regulate the synthesis of proteins, as the information of life from history, non-coding DNA has significant effect on the development and evolution of life. In 2005, Elgar *et al.* reported a study by used a whole-genome comparison between human and the pufferfish to identify nearly 1,400 highly conserved non-coding sequences. The study proved that the accuracy for the replication of non-coding DNA is of significant importance for vertebrate development.[17]

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16. The genetic information carrier of some types of viruses is RNA. RNA has relatively higher mutation probability compared to DNA. In technical sense, viruses still have ambiguities to be defined as life: Some people argue that viruses are only objects that hijack the imperfections of life to self-replicate.

17. *PLoS Biol.* **2005**, *3*, e7

3.1.2 General social relation

For economic society, social relation is presented by objects that span different ranges of space and time. The objects include but are not limited to: civilization, culture, ideology, religion, political system, laws, moralities, etc. The social relations at all levels of hierarchy in the economic society have undergone extensive selection and refinement in the long history of time, and develops under the influences of both internal and external environment. We could judge the kinship between two economic societies by analyzing the similarities of the social relations of the two economic societies. We could also explore the development status (both spatially and historically) of the environment that the economic society dwells in, by studying the social relation development status of the specific economic society. In a word, the general social relation of economic society carries the historic and current information of its development. We could also predict the development status of one economic society by exploring the characteristics of its general social relation and the characteristics of its external environment.

The general social relation of economic society includes two parts: a) Overall historical memories of the economic society during its development; b) Current social relation system that regulate the functioning procedures of the economic society at now. General social relation could be approximately presented by civilization and culture, which cover as comprehensive as possible in terms of time and space.

Historical memory is of significant importance to the development of economic society even if it does not directly regulate the functioning of the economic society at now. The judicious and accurate recording/dissemination of historic information is of vital importance to the economic society. Martyrs who sacrificed their lives for the freedom and independence of their motherland should be forever remembered and honoured; Invaders who committed genocide and offended the interests of other nations should be condemned and cautioned. Recently, the film *Oppenheimer* uncovered many crimes of the Japanese invaders committed during WWII to the US audiences, which is a good example of the judicious and accurate recording and dissemination of historic information.

3.2 Genes and current social relation

To continue with the discussions in Section 3.1, genes are part of general genetic information and are expressed into proteins. From the perspective of evolution, information carried by genes comes from inheritance. For a life

species at a specific time in history, the information carried by genes regulates the functioning procedures of the species at the specific time.

Current social relation is the part of general social relation and regulates the economic activities at now. If general social relation is approximately presented by civilization and culture, current social relation could be approximately presented by current ideology, religion, political system, laws, moralities, etc.

3.2.1 Gene expression

Transcription and translation are the expression processes of genetic information for all life forms. Even for the gene expression of viruses, the majority of the processes is completed by the hijack of transcription- and translation-related proteins of host cells. For a single cell, the information carried by genes is the start point for all life activities; transcription[18] is thus the very first step of life activities. The primary enzyme involved in transcription is called RNA polymerase; the critical factor that influences the gene expression level (aka. transcription level) is a group of proteins called transcription factors. Transcription factors bind with the DNA strands to facilitate the transcription procedures. Meanwhile, transcription factors bind with internal signals (metabolites) and external signals to undergo conformation changes. Since conformation changes affect the gene transcription level, the binding procedure between transcription factors and internal/external signals could be seen as the feedback of life towards the signals from the environment. Life gives effective feedback towards the signals from external environment via a series of biochemical reaction: This procedure is the basis of life to accommodate and reshape environments, and is thus the meaning of life to exist in nature.

For prokaryotes which do not have sophisticated organelles (such as nucleus, where transcription happens in eukaryotes), their transcription is still influenced by internal/external signals via the binding with the transcriptions factors. Since prokaryotes carry relatively simple genetic information, the types of external signals that prokaryotes could give effective feedback would be relatively fewer: The function of prokaryotes is thus less sophisticated compared to eukaryotes. The signaling pathways in prokaryotes are less complicated compared to the situation in eukaryotes; also, the gene expression modes that are in backup with each other or in the purpose of system balancing are fewer compared to the situation in eukaryotes. As a result, prokaryotes are unicellular and the concept of cell differentiation virtually does not exist in prokaryotes.

For eukaryotes, the cells have sophisticated organelles such as nucleus. In the nucleus, genetic information is properly stored; transcription occurs in the

18. Or the reverse transcription process that viruses hijack the host cells to perform

nucleus and is separated from the translation that occurs outside of the nucleus. Eukaryotes bear relatively more sophisticated genetic information, the types of external signals that eukaryotes could give effective feedback would be relatively more: The function of eukaryotes is thus more sophisticated compared to prokaryotes. The signaling pathways in eukaryotes is more complicated compared to the situation in prokaryotes; also, the gene expression modes that are in backup with each other or in the purpose of system balancing is readily available in eukaryotes. Up to now, human transcription factors are still in the process of discovery and function analysis.[19] As a result, many eukaryotes are multicellular and the concept of cell differentiation is as important as the division of work of proteins inside a single cell.

3.2.2 Embodiment of current social relation

In economic society, policy making and policy implementation is the embodiment process of current social relation. Even for the mafias in the economic society, their social relation is embodied by the hijack of policy makers under the conditions that current administration has imperfections in the policy system. For an economic society, the information carried by current social relation is the start point for all economic activities; policy making is thus the very first step of economic activities. Policy makers carry out administrations according to the current social relation system (including political system, laws, ideology, etc.); meanwhile, policy makers and policy influencers adjust the administrations as the feedback to internal/external signals of the economic society. Economic society gives effective feedback towards the signals from external environment via a series of economic activities: This procedure is the basis of economic society to accommodate and reshape environments, and is thus the meaning of economic society to exist in the world.

The size of economic society/entity in our study is variable: For a family, a city, a country, the whole human society, they could all be considered as an economic society/entity to be studied. For less sophisticated economic entities, the policy making procedures might not occur in a fixed area. Take a family as an example, the husband and wife could decide on some issues either on a trip, or at home, or anywhere else. Despite the informality, the policy making procedures are still influenced by internal or external signals. For these less complicated economic entities, their social relation is relatively simple; the external signals that they could provide effective feedback is relatively fewer.

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19. *Cell* **2018**, *172*, 650-665

Thus the functions of these economic entities are relatively simple and the study of these economic entities is easier.

Still take a family as the example. A family is relatively simple from the perspective of functions as economic entity. As an economic entity, a family could be involved in the activities in larger family groups, or in the activities of social communities. Apart from these activities, a family could not have more sophisticated economic functions on its own: Thus people could not form social relation networks that are in backup with each other or in the purpose of system balancing, solely based on a family. Also, a more sophisticated economic society cannot be formed based on the simple replication of families. For each of the family members, he/she could be involved in more sophisticated economic activities in other occasions: A family member could in the same time function as a member of a community, a company, an institution, or even a country.

Sophisticated economic societies typically consist of subordinate economic entities; the hierarchies of the constitution could be varying according to the complexity of the economic society. The inheritance and embodiment of social relation in sophisticated economic societies are implemented in relatively fixed areas such as schools, libraries, museums, chapels (for social relation inheritance), and governmental residences (for policy making). Also, the places for policy making are usually different from the places for policy implementation. Sophisticated economic societies have more comprehensive system of social labour division, which makes the external signals that they could give effective feedback more versatile. Thus the functions of sophisticated economic societies are more comprehensive.

For sophisticated economic societies, the signaling pathways of internal and external information is longer to reach to the policy-making people compared to the situation in simple economic societies/entities. This means the management of sophisticated economic societies is more difficult; the study of these types of economic societies is more difficult; and the team of policy-making people in these types of economic societies is more complicated. In sophisticated economic societies, the social relation networks that are in backup with each other or in the purpose of system balancing are readily available: As a result, sophisticated economic societies consist of many subordinate economic entities with clear labour division, and with proper backup or balancing between each other. During the activities of sophisticated economic societies, the labour division and cooperation between subordinate

economic entities are as important as the labour division and cooperation between the constituents inside the subordinate economic entities themselves.

3.3 Cell differentiation and social labour division

3.3.1 Cell differentiation and gene regulations: Entropy decrease in life

As previously discussed in Section 3.2, cell differentiation is a gene expression mode at higher sophistication level. After the long history of evolution and natural selection, sophisticated forms of life are equipped with sufficient genetic information to realize cell differentiation. The protein system (generated by gene expression) could realize more than the implementation of versatile biochemical processes: The protein system could equip life with differentiated cells since the genetic information in these life forms are in backup with each other or in the purpose of system balancing. Starting from cell differentiation, tissues and organs are formed to realize more sophisticated and more versatile functions; advanced forms of life are available to exist in nature. In the mean time, life forms at different levels of sophistication and with different specialties together form the ecosystem in nature, with the life forms in backup or in balance with each other.

For a life form with sufficient genetic information to realize cell differentiation, at first thought, if every gene is fully expressed in every cell, the functions of the life form could be expressed at maximum extent. However, since the expression of genetic information consumes significant amount of resources from life, the living organism needs to delicately allocate resources to every organ, tissue and cell. The regulatory work performed by life could maximize the utilization efficiency of limited resources in the purpose of survival in natural selection. Life forms evolving towards higher levels of sophistication is thus based on cell differentiation and the associating regulatory work performed by life.

Life is a system that consists of both entropy increase and entropy decrease processes. In life, any free expression of genetic information is spontaneous: This correlates to the entropy increase processes in physical chemistry. The planning and regulations that life imposes on gene expression (for the interests of life as a whole) is non-spontaneous: This correlates to the entropy decrease processes in physical chemistry.

In the world of physical chemistry, systems generated by entropy decrease are always cherished by people since ordered/organized systems represent high quality and competency. In the mean time, under the disturbances from internal and external environment, highly-ordered systems are inclined to decompose into chaos.

For sophisticated life forms, the planning and regulations of gene expression is of vital importance for the survival of life species: Under the disturbances from internal and external environment, highly ordered system (aka. sophisticated life form) would suffer from the consequences of dysfunction of gene regulation. Take human as an example, leaving aside the diseases caused by the infections or attacks from other species,[20] the imperfections in gene regulation itself could make people suffer from diseases at different levels of severity, in any stage of life. From insignificant illnesses such as mild allergies and slight inflammations, to life-threatening diseases such as autoimmune diseases and cancers: They are all consequences of the imperfections of life to plan and regulate gene expression procedures.

3.3.2 Social labour division and regulations: Entropy decrease in economic society

Compared to the simple labour division during the implementation of a specific task, social labour division is an advanced form of social relation embodiment procedure. Typically, social labour division occurs in sophisticated economic societies, and more specifically, between the subordinate economic entities of the economic society. After the long history of development, sophisticated economic society has sufficient social relation to realize social labour division. The people with versatile occupations (generated by social relation embodiment) could realize more than a specific task that requires labour division and cooperation: Via social labour division, the occupation system could equip the society with subordinate economic entities that are in backup with each other or in the purpose of system balancing. Starting from social labour division, economic societies/entities with multiple hierarchies are formed to realize more sophisticated and more versatile functions; advanced forms of economic societies are available to exist in human society. In the mean time, economic societies at different levels of sophistication, with different climate and geographical conditions, bearing different cultural images, and with different specialties, together form the economic society of the whole humanity. In the economic society of the whole humanity (aka. global economy), the constituting economic societies (mostly in the forms of sovereign countries) are also in backup or in balance with each other.

For an economic society with sufficient social relation to realize social labour division, at first thought, if social resources are fully allocated into every occupation, the functions of the economic society could be expressed at

20. It should be noted that under many circumstances, the infections or attacks from other species are one of the reasons leading to the dysfunction of gene regulation in human.

maximum extent. However, since the activity of any occupation consumes significant amount of social resources, the economic society needs to delicately allocate resources to every subordinate economic entity, every occupation and every people. The regulatory work performed by economic society could maximize the utilization efficiency of limited resources in the purpose of survival in contest. Economic societies evolving towards higher levels of sophistication is thus based on social labour division and the associating regulatory work performed by the economic society.

Similar to life, economic society is a system that consists of both entropy increase and entropy decrease processes. In economic societies, any free market activity is spontaneous: This correlates to the entropy increase processes in physical chemistry. The planning and regulations that economic society imposes on free market activities (for the interests of the society as a whole) is non-spontaneous: This correlates to the entropy decrease processes in physical chemistry.

In the world of physical chemistry, systems generated by entropy decrease are always cherished by people since ordered/organized systems represent high quality and competency. In the mean time, under the disturbances from internal and external environment, highly-ordered systems are inclined to decompose into chaos.

For sophisticated economic society, the planning and regulations of free market activity is of vital importance for the survival and development of the society: Under the disturbances from internal and external environment, highly ordered system (aka. sophisticated economic society) would suffer from the consequences of regulation dysfunction. Take a sovereign country as an example, leaving aside the challenges caused by the penetrations or attacks from other countries,[21] the imperfections in social relation system itself could make the country encounter challenges at different levels of severity, in any stage of development. From insignificant problems such as public security flaws, to country-threatening challenges such as coup d'état and civil wars: They are all consequences of the economic society failing to properly plan and regulate free market activities.

3.3.3 Planned economy and free market economy

For both life and economic societies, their existence is accompanied by the spontaneous entropy increase processes and the non-spontaneous entropy decrease processes all the time. As described in Section 3.3.1, the entropy

21. It should be noted that under many circumstances, the penetrations or attacks from other countries are one of the reasons leading to the regulation dysfunction of the economic society.

increase processes in life correlates to the free expression of genetic information; the entropy increase processes in life correlates to the planning and regulations that life imposes on gene expression. As described in Section 3.3.2, the entropy increase processes in economic society correlates to free market economy; the entropy decrease processes in economic society correlates to the planning and regulations that economic society imposes on free market activities (aka. planned economy). For any system (not limited to life and economic society in our study), the entropy increase and decrease processes are always accompanied by each other: The fundamental reason for this argument lies in that orderliness could only exist in the pretext of unordered choices.

For all economic societies (in any historical background, with any size), planned economy is the foundation of their existence. One of the typical elements of planned economy is taxing: Refusing to pay taxes to the country is refusing to pledge allegiance to the economic society, which is an important reason for the decomposition of the society. For superpowers such as USSR, United States and China, just put aside the reigning ideology (whether it is a communist state or a capitalist state), their formidable national powers are all based on the balance between planned economy and free market economy.

The United States is a capitalist country with the general image to the world as freedom defender. Thus the free market economy (entropy increase) seems to be the foundation of the road to greatness of the US. Yet this argument is only half of the overall right answer. We cannot ignore the contributions of the administration of Franklin Roosevelt and the economic theories of John Keynes, which both lead to the allocation of vital social resources to the government. With the resources in hand, the US government could implement planned economy (entropy decrease) that constructed critical infrastructures and started the third industrial revolution. Renowned public research institutions such as NASA, NIH and national laboratories made great contributions to the development of humanity: This is the typical activities of planned economy at the level of sovereign country. Currently, the superpower of the US is in retreat; this is directly related to the retreat of planned economy in the US, leading to the imbalance between planned economy and free market economy. Typical social phenomena of the imbalance include but are not limited to: NASA subcontracts core projects to private companies; pharmaceutical companies, insurance companies and medical institutions have monopoly on the pricing of American medical system; gigantic corporations evade taxes by controlling the government.

The USSR was a communist country with public ownership as the foundation of economy. Planned economy was thus the determining sector of the national economy of the USSR. The birth and early stages of USSR was accompanied by wars to defend the nation from invaders. Being in a war naturally forces the nation to plan nearly everything to win the war at all costs. Thus at war, the balanced state (between planned economy and free market economy) would be very special and there might be very little space for free market economy. From the historic point of view, totally implementing planned economy helped the country with a big win and lead USSR into power and glory after WWII. Yet after WWII, too little space of free market economy would lead to the imbalance between planned economy and free market economy: Looking at the history from current point of view, it seems that free market economy needed more space to rebuild the balance. Ignoring the daily life needs of people, spending too much social resources in the cold war with the US, exporting socialism ideology recklessly to other nations without respecting the choices of the object country, top USSR officials committed revisionism after WWII: These are all factors leading to the breakdown of USSR.

The breakdown of the USSR, however, does not necessarily mean that communism is not the future of humanity. Also, the breakdown of USSR does not mean that communism would cease to exist in the places that the USSR had governed. It might just be an obstacle that tackled humanity in 1991, which people could learn lessons from and could recover from. Logically, economic societies with higher levels of sophistication naturally correlates to the sheer amount of free market economy (entropy increase), and this needs a proper balance from planned economy (entropy decrease). Since the planned economy under socialism/communism ideology correlates to the entropy decrease processes in human society, provided that human society develops towards higher level of sophistication, socialism and communism could always provide proper solutions to the world.

China is not the first country to implement socialism in the world; yet until now, China is the most successful country to implement socialism in the world. One of the reasons for the success is that China learned lessons from the experiences of USSR; but this is not the fundamental reason. Over the long history of development, China had accumulated sufficient social relation to realize a very sophisticated economic society; and this economic society naturally requires significant amount entropy decrease processes to function properly. In different times of history, the ideology that correlated to the entropy decrease processes in economic society would vary in forms. In the recent 100~200 years, communism/socialism is probably the most matching ideology with Chinese

culture to realize the entropy decrease processes in economic society, thereby reaching the goal of balance between free market economy and planned economy. As a result, the balance has generated a huge success for the development of Chinese economic society.

Similar to the USSR, the establishment of new China went through a series of wars ranging from 1839 (First opium war) to 1953 (Korean war). Chinese people had a surprisingly long time to find a proper solution before communism became the final choice. Planned economy based on the dominance of public ownership roughly started in 1953 featuring five-year plans (a heritage from the USSR), which continues until now. Thanks to the planned economy, China now owns the most comprehensive industrial system in the world. But this does not mean that Chinese people did not encounter setbacks during the development: Social campaigns such as Great Leap Forward and Cultural Revolution are examples of the society ignoring the importance of free market economy. Also, the breakdown of the USSR gave Chinese people lessons from outside. Chinese people generally realized that to make a gigantic economic society function properly, apart from the dominance of planned economy, free market economy is not only important, but also necessary.

Some historical events illustrate the gradual recognition of the necessity of free market economy by Chinese people. In 1978,[22] Reform and Opening-Up started to include various elements of free market economy into Chinese economic society. In 2004, “Citizens’ lawful private property is inviolable” (Article 13) was written into the Constitution of the People's Republic of China. In 2013,[23] CPC Central Committee decided that “The market is allowed to play a decisive role in allocating resources”. These events all reflect the mentality of Chinese people focusing on the balance between free market economy and planned economy: Both elements are of vital importance and each element has its proper role. In fact, if we do not have the choices of development directions offered by free market economy, we cannot even select from the choices to implement planned economy.

Nevertheless, free market economy is based on private ownership; and private ownership leads to exploitation and injustice.[24] The size, weights and operating ranges of free market economy need strict regulation to reach the balance. The uncontrolled development of free market economy would lead a gigantic economic society into dissociation or breakdown, just like the consequences

22. 3rd Plenary Session of the 11th Central Committee of the Chinese Communist Party

23. 3rd Plenary Session of the 18th Central Committee of the Chinese Communist Party

24. Jean-Jacques Rousseau - *Discours sur l'origine et les fondements de l'inégalité parmi les hommes*

from totally implementing planned economy (lessons from the USSR). The example goes into the current United States. The post-WWII prosperity of the US could be attributed to the balance between planned economy and free market economy.[25] But now, the US is encountering challenges from the national superpower retreat and the increasingly fragmented society: These challenges could be attributed to the fact that the elements of planned economy are in retreat and the elements of free market economy are developing in an increasingly uncontrolled manner.

From the discussions in this Section, we could compare the proper function of an economic society to the healthy lifestyle of a human being. Keeping a lifestyle that consists with natural rules, having self-discipline: These examples of planned lifestyle should be the mainstream of a human being. This could be compared to the planned economy as the mainstream of the economic society. Relaxing, resting and having recreations under proper conditions: These examples of free lifestyle is the necessary complement of one's life.[26] This could be compared to the free market economy implemented at proper extents/ranges in the economic society. For the topic of which social resources should be allocated to planned economy and which social resources should be allocated to free market economy, the discussions will be described in detail in Chapter 4.

3.4 Self consciousness and collective consciousness

As a human being, each individual of us is a member of a group or collective such as a family, an institution, or a country. The group or collective has its collective consciousness, which might be consistent, or inconsistent with our self consciousnesses. The ideal development status of a collective is based on the consistency between the collective consciousness and the self consciousnesses of the constituting members. As Warren Buffett put "never bet against America",[27] an individual's long-lasting success is always based on the success of the collective he/she belongs to. Whichever ideology we hold, proactively communicating with the collectives that we are in, and trying to reach consensus with the collectives would be a reliable pathway to succeed.

As a human being, each individual of us is in the same time a gigantic collective of the constituents of our bodies. If the constituting proteins of our

25. Also, US economic policies by then were free from the rivalries between capitalism and communism

26. Also, the free lifestyle could make people able to distinguish (via trial and errors) which activities are in consistent with natural rules and should be conformed as a plan.

27. https://www.cnbc.com/2021/02/27/warren-buffett-says-never-bet-against-america-in-letter-trumpeting-berkshires-us-based-assets.html

bodies have self consciousnesses of their own, the self consciousness of each individual of us will be the collective consciousness of the constituting proteins. "Γν□θι σαυτόν" (know thyself) is probably the perpetual topic of our lives, since we could never get a clear view of what our constituents are thinking about (Of course, we do not have to do this thoroughly). Since the ideal development status of a collective (each of us as an individual) is based on the consistency between the collective consciousness and the self consciousnesses of the constituting members (the constituting proteins of our bodies), it is of great importance to effectively communicate with the constituting parts of our bodies (such as routine health check and self-reflection) and reach consensus with ourselves. Through this, we could lead a proper lifestyle in food, sport, work, recreation and rest: The success of each of us could then be realized.

From the discussions above, we could assume that for atoms, molecules, organelles, cells, tissues, organs, humans, economic entities/societies at hierarchies low to high (all the way through to human society), each of the objects has self consciousness on its own. The self consciousness of an object is the collective consciousness of the objects at lower hierarchy; the sum of the self consciousnesses of this type of object (aka. their collective consciousness) is the self consciousness of an object at higher hierarchy. For objects at any level of hierarchy, they would have their specific operating principles; in the same time, the objects at different hierarchies would share many operating principles, which we call "natural rules". Biopolitical economics is thus a subject trying to find the shared principles between life sciences (the study of life) and political economics (the study of human economic society). Based on biopolitical economics, some natural rules could be revealed for both life sciences and political economics.

4. **Allocation of Resources**

In a living organism, apart from proteins and nucleic acids, the most important constituent is the resources in the species. Life activities are essentially the process of constituting proteins to function under the regulations of genetic information: Transformation and utilization of resources in life is thus the core activity. In life activities, saccharides, lipids (free form) and biomembranes (fixed forms of lipid) are all embodiment forms of resources; and they could undergo versatile transformation processes into each other. The liquidity, resource density and intimacy with proteins for saccharides, lipids (free form) and biomembranes (fixed forms of lipid) significantly vary; yet in the same time, all of the embodiment forms are of vital importance to life.

In an economic society, apart from the people and social relations, the most important constituent is resources in the economic society. Economic activities are essentially the process of the people to function under the regulations of social relations: Transformation and utilization of resources in economic society is thus the core activity. In economic activities, currencies, financial capitals (liquid forms of capital) and means of production (fixed forms of capital) are all embodiment forms of resources; and they could undergo versatile transformation processes into each other. The liquidity, resource density and intimacy with the people for currencies, financial capitals (liquid forms of capital) and means of production (fixed forms of capital) significantly vary; yet in the same time, all of the embodiment forms are of vital importance to the economic society.

4.1 Saccharides and currencies

4.1.1 Basic functions

In nature, chemical conversions are accompanied by the input or output of energy: The chemical bonds are thus the carriers of energy. The resource-related breaking/rebuilding processes of bonds requires a shared energy carrier for life to standardize life processes and to differentiate from disorganized non-life processes. Saccharides were selected by nature as the energy carrier of life, majorly due to the chemical bond energy consistency with proteins/nucleic acids, and the availability of C, H, O elements on planet Earth. The circulation of saccharides in life needs the background of metabolism system of the specific life form. Thus for different life forms, the circulating saccharides might vary in structure. However, different forms of saccharides could undergo biochemical conversions to be properly utilized between different life species. Apart from being circulated in life and carrying energy, saccharides could undergo other biochemical process to form nucleic acids and lipids. Saccharides could also functionalize some types of proteins to form glycoproteins: Glycosylation of proteins enable proteins properly function in various biochemical processes.

In economic society, economic activities are accompanied by the creation and utilization of social values. The creation and utilization of social values are accompanied by the exchange of social products. Under the regulations of social relations, the primitive goods-for-goods exchange mode standardized into the circulation of currencies; and currency is thus a reflection of values. The circulation of currencies needs the background of social credits based on social labour division. Thus for different economic societies, the circulating currencies might vary in forms. However, different currencies could be

exchanged during international trading activities. Apart from being circulated in economic society, currencies could be involved in special economic activities that influences social relations or generates financial capitals. Some types of occupations need intensive cooperation between the people and currency: Only with the ammunition of currency to prove the sufficient affordability, the task of the specific people could be properly realized.

4.1.2 Quantity in decent level

For a living organism, especially for advanced forms of life, the sugar levels need to be maintained at a decent level to enable normal life activities. For human beings, maintaining blood sugar to decent level is of vital importance as hypoglycemia, hyperglycemia and diabetes could all cause life-threatening risks. The decent quantity of sugar intake for a living organism is determined by the metabolic ability (aka. physical function) of the species for the time being. That is to say, the constituting proteins system's ability (along with other constituents) to perform normal biochemical conversions of sugar, determines the decent amount of sugar intake of the living organism.

For a human being, when his/her physical function is at lower status compared to normal situations, the decent amount of sugar intake should be reduced accordingly. After the physical function recovery, the decent amount of sugar intake could return (increase) to normal status. If a person is in a state of mentally stressed and cannot have proper rests, the signaling system of the body might have dysfunctions. As a result, his/her sugar intake might increase rather than decrease when the physical function drops. The main reason for this abnormality is that the process of sugar intake naturally pleases human's nervous system (directly related to human's control system), which is a seemingly relief of the stress. Excess intake of sugar could lead to "stress weight gain" and the risk of inflammation increases.[28] When sugars cannot be consumed by normal biochemical processes, they will intervene with many biochemical processes that do not need the participation of saccharide molecules; and thus inflammation occurs. When feeling low, just relax and have better plan of life. There is no need to let mental stresses mislead people's judgment of the decent amount of sugar intake, which is of much help for one's health.

For an economic society, especially for advanced forms economic society, the levels of currency circulation need to be maintained at a decent level to enable normal economic activities. Both excess or insufficient amount of currency supply could lead to social problems at different levels of severity. The decent

28. *Front. Immunol.* **2022**, *13*, 988481

quantity of currency supply for an economic is determined by the economic vitality of the economic society for the time being. That is to say, the vitality of the social members from all occupations (along with other constituents) to produce social values with the help of currencies, determines the quantity of currency supply of the economic society.

For an economic society, when its economic vitality is at lower status compared to normal situations, the decent amount of currency supply should be reduced accordingly. After the economic vitality recovery, the decent amount of currency supply could return (increase) to normal status. If an economic society is in a state of social tension or social conflict due to various reasons (such as ideology fragmentation, improper distribution of social resources, etc.), the constituents of the economic society could not perform sensible communication inside the society and the information system in the society might have dysfunctions. As a result, the currency supply might increase rather than decrease when the economic vitality drops. The main reason for this abnormality is that the process of currency supply naturally pleases economic entities that are directly related to the society's policy-making parts, which is a seemingly relief of social tension. Currency oversupply could reduce operating efficiency in most of the businesses in the society; in the same time, risks of social tension and social conflicts increase dramatically. When money cannot be consumed by normal economic activities, they will intervene with many economic activities that do not need the participation of money, or at least not that much amount of money; and thus barriers, tensions, conflicts occur. A proper plan to regulate the economic activities is important to economic societies. Especially when economic vitality is low, reallocation of social resources to genuinely reduce social tensions should be considered: This would correct the society's judgement of currency supply, which is of much help for the health of the economic society.

4.2 Lipids (free form) and financial capitals (liquid forms of capital)

4.2.1 Lipids (free form)

When the energy intake of life exceeds the required energy for basic life activities, the energy carrier (saccharides) could be transformed into free form of lipids. Lipids (free form) could also be digested and absorbed from exterior environment, which is also an important source of lipids for life. Compared to saccharides, lipids contain more C-H bonds (higher bond energy) and fewer C-O bonds (lower bond energy), which means that lipids have higher energy density as energy storage medium compared to saccharides. Meanwhile, to

release the energy stored by lipids, more resources are required to implement the related catabolism processes.

The most important function of lipids (free form) is not energy storage. The most important function of lipids (free form) is to be the precursor to form biomembrane systems (i.e. settling down from free forms to fixed forms), by the coalition with proteins. Critical biochemical processes are all related to biomembranes and membrane proteins.

The typical structure of lipids is a long C-H chain consisting of more than 10 carbon atoms. A special group of lipids called steroids, has typical basic structure of four hydrocarbon rings fused together (gonane). Steroids exist in most types of cells in life and are involved in many important biochemical processes. Along with proteins, polypeptides and other signaling molecules, this special type of lipid undertake an important role in the regulatory activities of life.

4.2.2 Financial capitals (liquid forms of capital)

When the social values created by economic society exceeds the basic living needs of the people in the society, currency in circulation would converge to transform into financial capitals. Directly looting financial capitals from other economic societies, or mining from nature, is also an important source of financial capitals. As had been mentioned in Section 1.5, financial capitals have attributes of being available to be traded in market; and their resource (social value) density is higher compared to currencies. Yet in order to be converted into social values, more social resources are also required (compared to currencies) to realize the corresponding economic activities.

The most important function of financial capitals is not resource storage. The most important function of financial capitals is to be the precursor to form means of production (i.e. settling down from liquid forms to fixed forms), by the coalition with the people (labourers). Critical social activities are related to means of production and the corresponding labourers.

Financial capitals could do more than undertaking the role of social resource storage media and the component of means of production. A special type of financial capitals could function as the tool for policy implementation, along with other forms of policy tools, to accurately regulate target economic activities.

4.2.3 Financial capitals - tool for good, tool for bad

Lipids are after all lipids. Even if lipids are the convergence of energy, without the coalition with proteins, lipids are no more than other carbohydrates or fossil

fuels to be finally combusted or decomposed. Getting fat is much easier compared to getting fit: Getting fat only need the intake of sugar and fat; getting fit need a good cooperation between proteins and the resources inside the body.

Capitals are after all capitals. Even if capitals are the convergence of social resources, without the coalition with the people (labourers), capitals are no more than other social resources to be finally consumed or decomposed. For an economic society, getting rich is much easier compared to getting strong: Getting rich only needs the control of social resources; getting strong needs the good synergy between the people and social resources.

After WWII, the United States established dollar credit system worldwide and the US dollar circulated as the most reliable currency in international trading. For some countries, US dollar might be even more reliable compared to the domestic currency. This phenomenon greatly facilitated the development of many economic societies, since the credit of US dollar has a strong background of productivity from the US. Globalization of US dollar currency offered a stable medium of social resources for many economic societies to utilize, which makes the US a reliable leader for many countries.

But when the economic society of United States faces the challenges of erosion from imperialist capitalism (aka. imperialism), situations began to change. Imperialist capitalism homogenize capitals with labourers by labeling both capitals and labourers with prices, the intention of which is to seize/control social resources as much as possible. But the attributes of labourers to constitute economic society are totally different from the case of capitals: This could be compared to the fact that proteins and lipids are totally different in chemical structure and in biological function as the constituents of life. Denying the distinctiveness of the people's role in economic society and homogenizing labourers with capitals are the original sins of imperialism. Imperialism is also the ideological basis of the deeds done by capitalists to loot social resources from everywhere in the world simply by printing money, generating financial capitals out from nowhere, and trading with the world backed by the US dollar credit system. Gradually, many economic societies in the world find that using US dollars are increasingly costly and there might be other candidate currencies as complement or even as substitute.

As previously discussed in Section 1.5, financial capitals cannot be freely traded with means of production (fixed forms of capital) in economic societies, which is similar to the fact that lipids (free form) cannot be freely interchanged with biomembranes (fixed forms of lipid) in life. If there is any uncontrolled interchanges between lipids (free form) and biomembranes (fixed form) in life,

this indicates abnormality or decomposition is happening in life. Trying to freely trade financial capitals with means of production everywhere in the world, is to loot or exploit from everywhere in the world. Using financial capitals as a tool to loot or to exploit does not only happen outside of the US; it happens in the same intensity in the US. The US, previously full of creativity and productivity, is becoming more and more "fat" (lots of financial capitals in the economic society) and "fragile" (labourers cannot have ideal coalition with capitals to form productivity), just like the obese patients (which exist in huge amount) in the US.

From the discussion above, we could argue that in economic activities, acknowledging the distinctiveness of both labourers and capitals are of vital importance. Only by doing this, labourers and capitals could have ideal coalition to form productivity at maximum efficiency. To realize the ideal coalition, public ownership of social resources is the basis: And this also supports the argument that communism ideology is the future of humanity.

In the above-mentioned paragraph, one important argument has not been discussed in detail: Why public ownership of social resources is the basis of the ideal coalition between labourers and capitals to form productivity at maximum efficiency? This argument will be discussed in detail in Section 4.3.

4.3 Biomembrane system and means of production

4.3.1 Basic functions (some rephrases of previous contents)

Biomembranes basically consist of phosphorylated lipid, an amphiphilic form of the lipid to build the bilayer structure (i.e. the fixed forms of lipid) in life. Biomembrane system functions with the proteins that are inserted into the bilayer structure. Biomembrane system is the most important location for life activities, since virtually all biochemical reactions (or reaction pathways) are related to biomembrane system. As had been described in Chapter 2, representative biochemical processes include but are not limited to molecular recognition, molecular transformation, signaling management, etc.

Means of production basically consist of fixed forms of capital, which are in coalition with the people (labourers) in the economic society. Means of production give out productivity by the manipulation of the people (labourers). Means of production is the most important location for economic activities, since virtually all economic activities proceed with the background of means of production. As had been described in Chapter 2, representative economic activities include but are not limited to the judgement of alignment or conflict of interests, production of goods, signaling management, etc.

4.3.2 Control of biomembranes by proteins, regulation of life activities

Proteins, metabolites and all other life-related molecules are compatible in the chemical environment offered by biomembranes, majorly due to the amphiphilicity of biomembranes. The distribution of proteins in biomembrane system (i.e. the control of biomembranes by proteins), is the basis of interests for all life components during life activities.

Life is an object with immense complexity. For a living organism at high level of sophistication, life activities are accompanied by homeostasis states[29] and non-homeostasis states of cell groups (such as cell differentiation, apoptosis, etc.). No matter which state the cell groups are in, the distribution of proteins in biomembrane system has a decent pattern to fulfill the normal functions of the cells. For cell groups at non-homeostasis states, typical functions of the cell groups undergo processes from non-existence to existence, or from existence to non-existence. Accordingly, the corresponding biomembrane systems also undergo processes from non-existence to existence, or from existence to non-existence.

Take example of a cell group that is newly generated from stem cell differentiation: This type of cell group previously did not exist, but exist now. To fulfill this transformation, the executing proteins (of the functions coming into existence) are sufficiently expressed now, but were much less expressed before the differentiation. From the perspective of the whole living organism (macroscopic perspective), the living organism needs to allocate resources with high priority to the newly-formed cell group to guarantee its development. From the perspective of the newly-formed cell group (microscopic perspective), proteins that were not sufficiently expressed in stem cells are now increasingly expressed: This phenomenon indicates that during cell differentiation, some types of proteins gradually manipulate/control part of biomembrane systems from scratch.

As for a cell group that is in the state of apoptosis, the corresponding biomembrane system along with the specific types of proteins would gradually fade out in the living organism. The whole process of apoptosis should also be delicately regulated by the living organism.

Cell groups are partially autonomous constituents of life, and are naturally available to expand in sizes when sufficient resources are offered. However, the resource that a specific living organism could offer to life activities is limited. All cell groups generated from cell differentiation could only obtain limited amount of resources after a certain period of time, which means that the cell

29. Homeostasis state of cell groups also include normal updates of cells in the specific cell group

groups would undergo the transition from non-homeostasis state to homeostasis state. From the perspective of the whole living organism (macroscopic perspective), resources allocated to the specific cell group would gradually stabilize into a decent range. From the perspective of the newly-formed cell group (microscopic perspective), the share of biomembrane system controlled by newly-expressed proteins would gradually stabilize into a decent range.

To properly enable the transition process in the paragraph above, the delicate regulation of life activities is of vital importance. Since cell groups are partially autonomous and could expand in an uncontrolled manner, the living organism should accurately allocate resources to each type of cell group with the purpose to make everything controlled. Illnesses or diseases at different levels of severity are related to the imbalance or dysfunction states during the regulation of life activities. Life activities could be categorized into different levels of essentiality. For an advanced form of life, the most essential life activities include but are not limited to respiration, immunity, metabolism of energy-related molecules, etc. If these activities are impaired, life-threatening risks would at once appear. Thus for life, the more essential life activities are, the more delicate and accurate regulations of these activities are required for the life.

For a living organism, when imbalance or dysfunction states occur during the regulation of life activities, some types of cell groups would develop in an uncontrolled (or poorly controlled) manner. From the perspective of the whole living organism (macroscopic perspective), the uncontrolled (or poorly controlled) state of the specific cell groups would consume more resources than the decent amount, thereby giving extra burdens to the living organism. From the perspective of the specific cell groups (microscopic perspective), the over-expression of certain types of proteins are directly related to the imbalance or dysfunction states of the regulation of life activities.[30] When the amount of overall biomembrane resource stays still, the over-expression of certain types of proteins would force part of other proteins out of the biomembrane system (when at normal state, these proteins should have good manipulation to the biomembrane system). Membrane proteins being forced out of biomembranes, would lead to dysfunction status of signal management during life activities.

For example, a certain type of protein would be recognized as “ally” by T cells if it is on the right place of biomembrane system. If this type of protein is

30. We cannot confirm whether the over-expression of certain types of proteins leads to the imbalanced (or dysfunction) status, or the imbalanced (or dysfunction) status leads to the over-expression of certain types of proteins. Yet in practice, the imbalanced (or dysfunction) status is virtually another presentation mode for the over-expression of certain types of proteins.

outside of biomembrane systems, its conformation would dramatically change: There is a possibility for T cells to recognize the protein as “enemy”. This situation would lead to autoimmunity dysfunction and illnesses such as inflammation or cancer might occur.[31]

4.3.3 Control of means of production by the people, regulation of economic activities

The people and all other economy-related objects are compatible in the environment offered by means of production, majorly because means of production could be manipulated by the people, and in the same time, could transform raw materials into products. The distribution of the people in means of production (i.e. the control of means of production by the people), is the basis of interests for all components of economic society during economic activities.

Economic society is an object with immense complexity. For an economic society at high level of sophistication, economic activities are accompanied by homeostasis states[32] and non-homeostasis states of industries (such as formation of new industries, exit of old industries, etc.). No matter which state the industries are in, the distribution of occupations in the means of production system (i.e. the people’s control of means of production system) has a decent pattern to fulfill the normal functions of the industries. For industries at non-homeostasis states, typical functions of the industries undergo processes from non-existence to existence, or from existence to non-existence. Accordingly, the corresponding means of production also undergo processes from non-existence to existence, or from existence to non-existence.

Take example of an industry that is newly generated from social labour division[33]: This type of industry previously did not exist, but exists now. To fulfill this transformation, the executing occupations (of the industry coming into existence) are sufficiently in demand now, but were much less in demand before the social labour division. From the perspective of the whole economic society (macroscopic perspective), the economic society needs to allocate resources with high priority to the newly-formed industry to guarantee its development. From the perspective of the newly-formed industry (microscopic perspective), occupations that were previously not sufficiently in demand are now increasingly in demand: This phenomenon indicates that during social

31. *Nature* **2008**, *454*, 436–444

32. Homeostasis state of industries also include normal productivity updates in the industry, on condition that the overall productivity of the industry remains still.

33. Forms of social labour division include but are not limited to: Technological progress, scientific revolution, etc.

labour division, some types of occupations gradually manipulate/control part of the system of means of production from scratch. Thus this is the blue ocean era of the industry.

As for an industry that is in the state of exit, the corresponding system of means of production along with the specific types of occupation would gradually fade out in the economic society. The whole exiting process should also be delicately regulated by the economic society.

Industries are partially autonomous constituents of economic society, and are naturally available to expand in sizes when sufficient resources are offered. However, the resource that a specific economic society could offer to economic activities is limited. All industries generated from social labour division could only obtain limited amount of resources after a certain period of time, which means that the industries would undergo the transition from non-homeostasis state (blue ocean era) to homeostasis state (red ocean era). From the perspective of the whole economic society (macroscopic perspective), resources allocated to the specific industry would gradually stabilize into a decent range. From the perspective of the newly-formed industry (microscopic perspective), the share of means of production system controlled by newly-formed occupations would gradually stabilize into a decent range.

To properly enable the transition process in the paragraph above, the delicate regulation of economic activities is of vital importance. Under the premises of free market economy, private ownership and capitalist ideology urge the control/manipulation of resources should expand in an uncontrolled manner, no matter whether the industry is at homeostasis or non-homeostasis state. Thus the economic society should accurately allocate resources to each type of industry with the purpose to make everything controlled. Social problems at different levels of severity are related to the imbalance or dysfunction states during the regulation of economic activities. For an economic society, economic activities could be categorized into different levels of essentiality. The more essential the economic activities are, the more delicate and accurate regulations of these activities are required for the economic society; and it is more important to have dominance of public ownership (aka. elements of planned economy) in the corresponding industries. If the essential activities function in an uncontrolled manner, risks that threaten the basis of the economic society would appear.

For an economic society, when imbalance or dysfunction states occur during the regulation of economic activities, some types of industries would develop in an uncontrolled (or poorly controlled) manner. From the perspective of the

whole economic society (macroscopic perspective), the uncontrolled (or poorly controlled) state of the specific industries would consume more resources than the decent amount, thereby giving extra burdens to the economic society. From the perspective of the specific industries (microscopic perspective), the excess manipulation of means of production by certain types of occupations (i.e. the existence of capitalists) are directly related to the imbalance or dysfunction states of the regulation of economic activities. When the amount of overall resource of means of production stays still, the excess manipulation of means of production by capitalists would force part of other labourers out of the means of production system (when at normal state, these labourers should have proper manipulation to the means of production system). Labourers being forced out of the means of production system, would lead to dysfunction status of signal management during economic activities.

For example, a person would be regarded as “comrade” if he/she is in an economic entity with public ownership as the basis. If he/she no longer has proper manipulation to (or being forced out of) the means of production system, he/she would be regarded as the “employee” reporting to his/her “employer”. If he/she is jobless, he/she might be regarded as “outlaw” to make a living. The absolute difference on the control or manipulation of means of production system, leads to class conflict between proletarians and capitalists. Class conflict would prevent people from looking at things from the same standpoint, thereby leading to the dysfunction status of signal management during the entire process of economic activities. As a result, the economic society would encounter challenges from social conflict or confrontation when distribution of social resources is poorly regulated.

4.3.4 Communism and socialism must prevail

From the discussions in Section 4.3.2, we could conclude that an advanced form of life would require delicate regulations of all life activities by life as a whole. Meanwhile, the more advanced the life form is, the higher level of regulative ability is required for the life form. From the discussions in Section 4.3.3, we could conclude that an advanced form of economic society would require delicate regulations of all economic activities by the society as a whole. The regulative activities, along with free market activities (backed by human nature), are both prerequisites for the economic society. Meanwhile, the more advanced the economic society is, the higher level of regulative ability is required for the economic society.

For a human being, self-discipline leads to freedom. Via self-discipline, an individual could level up personal ability to fulfill versatile tasks. Being able to

fulfill versatile tasks makes a person available to more choices in work and life, thereby reaching the goal of freedom. For an economic society, the general background of public ownership ensures its ability to regulate all constituting industries. The regulative activities implemented by the economic society as a whole, are the sine qua non for the economic society to develop towards a more advanced, more comprehensive status. We know that perfection is never easy to be realized: Even if regulative activities are properly implemented inside the society, disturbances from exterior environments such as natural disaster and wars/conflicts would be a great challenge to the road to prosperity. Yet despite the challenges, staying in the right pathway is always sensible.

History tells us that totally implementing public ownership in economic activities would be detrimental to the economy, since this violates the human nature chasing for interests. Meanwhile, totally implementing private ownership would be even worse, since this damages the basis of a society to develop towards a more advanced, more comprehensive state. Advanced forms of economic societies should have their essential economic activities based upon public ownership to enable vital regulative activities; private ownership should also be fully acknowledged in specific areas of economy to fulfill the human nature chasing for interests.

Provided that the development of human society targets at a more advanced, more comprehensive state, many economic activities that were previously newly-formed gradually become essential economic activities to human society. Under such circumstances, regulative activities in economic societies are thus increasingly in demand, especially for advanced forms of economic societies. The discussions above could be an argument against Janet Yellen's remarks in December 2023 that "Too strong a role for state-owned enterprises can choke growth".[34] From the perspective of biopolitical economics, state-owned enterprises are increasingly in need for the essential activities of a giant economic society. Thus communism and socialism are the future of humanity and must prevail.

4.3.5 Role of private ownership in socialist economy

It should be note that private ownership is backed by human nature to chase for interests. Thus despite that essential economic activities are regulated by public ownership, private ownership should undertake a necessary and significant role in socialist economy. The balance between public ownership and private ownership signifies the balance between planned economy and free market

34. https://china.usembassy-china.org.cn/remarks-by-secretary-of-the-treasury-janet-l-yellen-on-the-u-s-china-economic-relationship-2/

economy (also the balance between entropy decrease and entropy increase) inside the economic society.

For an economic society, natural environments and international contexts are constantly changing. To succeed in the competition with other economies (and also with the nature), essential economic activities of an economic society are constantly in need of adjustment to ensure maximum productivity of the society: Planned economy could properly implement the task of adjustment.

Private ownership could maximize people's productivity in chase for their own interests. For industries that are not in the areas of essential activities of the economic society, private ownership (along with free market economy) would offer significant amount of work positions to the labourers. More importantly, many new elements of productivity are generated by free market economy: These elements of productivity would become the candidate pool for planned economy to select; and some of the new elements of productivity would later become essential activities of the economy society. Thus private ownership (along with free market economy) offers important candidate elements for planned economy to implement the task of adjustment mentioned in the previous paragraph.

It should be noted that although chasing for personal interests is human nature, chasing for collective interests is also the nature for the economic society that we are in. Only when the interests of individuals are in harmony with the interests of the collective, that sensible solutions could be reached. As a result, to make private ownership legitimate in socialist economy, private ownership must conform to the regulative activities implemented by planned economy. Chasing for unconditional private ownership is refusing to accept the socialist economic system: Such deeds should be cautioned, restricted and punished.

4.3.6 Essentiality levels of economic activities, Maslow's hierarchy of needs

As discussed in Section 4.3.3, economic activities could be categorized into different levels of essentiality. The more essential the economic activities are, the more delicate and accurate regulation of these activities are required for the economic society. For current human society, highly essential economic activities include but are not limited to: Food supply, energy supply, communication, infrastructure, national defense, public security, education, healthcare, accommodation, social welfare & pension, banking & financing, internet (including artificial intelligence), etc.

We again use Chinese economy as an example to discuss the essentiality levels of economic activities. From 1953 to 1978, China followed the mode of USSR economy to totally implement public ownership in economic activities. Great

achievements had been made, especially in the fields of basic manufacturing industry; yet many obstacles were encountered without the vitality of free market economy. Starting from 1978, elements of free market economy (private ownership) gradually came into Chinese economy. The incorporation of free market elements had been performed in a highly prudent style. During the last 45 years, Chinese people has benefited a lot from free market economy, since many industries were filled with vitality when people could chase for interests of their own. In the same time, Chinese people found that some essential economic activities (industries) incorporated elements of private ownership beyond the appropriate limit: Social problems were then incurred in the corresponding areas of economy.

Food supply, energy supply and security are always vital to either a person, or a country. According to Maslow's hierarchy of needs, these topics falls into the bottom two hierarchies: Physiological and safety. In socialist China, economic activities involving food supply, energy supply, national defense and public security, have always been dominated by public ownership. This situation guarantees every citizen in China has equal basic rights to survival.

Communication, infrastructure and social welfare & pension are economic activities approximately related to the “belonging and love” hierarchy. On these topics of economic activities, socialist China has been keeping public ownership as the dominating element. Thanks to planned economy, China currently owns the most advanced system of high-speed railway, 5G communication and electricity supply infrastructures. Powerful electricity supply enables the ongoing clean energy revolution in China, featuring the whole supply chain of photovoltaics and electric vehicles.

Education, healthcare, and accommodation are economic activities that encounter more complicated situations. Education serving for personal interests, premium healthcare, as well as upgraded housing, are not quite essential for economic societies. Elements of private ownership had been incorporated into the non-essential part of these activities, and had greatly improved the quality of living in China. Meanwhile, basic education, basic medical care and basic accommodation are economic activities with high essentiality. Incorporation of private ownership into such areas, as we have observed in current Chinese economy, would lead to social inequality that hampers the productivity of labourers. Chinese people have observed social problems such as inequality in basic education, expensive essential medicines/medical treatments, expensive basic housings, etc. The government

is now working hard to reestablish the dominance of public ownership in the corresponding highly essential economic activities.

Banking & financing are tools for social resource distribution. This tool could both serve activities based on public ownership and serve activities based on private ownership. Chinese banking & financing system had been efficiently involved in highly essential economic activities to serve public ownership, and great success had been achieved. Yet in some highly essential economic activities (such as examples mentioned in the previous paragraph), the banking & financing system had provided services to private ownership, which is detrimental to socialist economy. China has now realized this problem, and is redirecting the specific divisions of banking & financing system to the right target.

The list of essential economic activities might change over time. Take internet as an example: Before the Information Age, internet was not available in human society and the related economic activities were thus not included in the list of essential economic activities. But now, internet has an irreplaceable position in the economy since it is related to national security, people's everyday communication, public information dissemination[35], etc. Also, artificial intelligence (AI) previously had insignificant productivity. Yet now, the productivity of AI is increasingly important and could remodel the situation of social labour division in the future. Thus internet, along with AI inside, should be considered as highly essential economic activities.

The rise of internet economy in China is very similar to the situation elsewhere in the world: Elements of private ownership dominated the economic activity in the start. Chinese government gave sufficient policy support to internet industry from 2010 to 2020, which made Chinese internet economy gigantic in volume. However, private ownership still dominated internet economy when internet had become a highly essential economic activity in China, giving rise to several private monopoly enterprises, and also leading to a sharp inequality of social resource distribution in internet economy. Chinese government realized the problem from 2020, and is now making efforts to gradually establish the dominance of public ownership in internet economy.

4.3.7 We need a world with sufficient inclusiveness, openness and versatility

In nature, versatile life forms/species are distributed in different territories and different time ranges. The deciding factors for the distribution include genetic information of life forms, as well as environmental conditions such as

35. Dissemination of public information may influence mainstream ideology in a subtle manner.

temperature, lighting, water, natural resources, etc. In all, life should fit to its natural surroundings.

If we assume the economic societies of humanity as special life forms with their respective characteristics, then in different territories and different time ranges, the inhabiting economic societies should have their decent political/economic rules fitting to their respective natural surroundings. Trying to use a series of preset political/economic rules to apply to economic societies with different cultural backgrounds, different climate conditions, different natural resource densities, and different levels of development, is futile and in the same time harmful to the development of the local economy.

Imperialism attempts to apply capitalist social relation system to every economic society in the world, which would only lead to the state of constant conflict and turmoil, and local resources being looted. Thus imperialism could not give sustainable progress for humanity. Respecting the choices of the local people and cooperating with each other on the basis of equality and mutual benefit, is the solution with inclusiveness and long-lasting goodness.

As has been described in Section 3.3, sophisticated economic societies should be equipped with more complicated organizations. Thus a highly advanced economic society should be sufficient inclusiveness to versatile constituents of the society. Racism and separatism are thus enemies to economic societies. Racists hold the mentality that their belonging group is “superior” to other groups. The mentality leads to the fact that racists’ group has a less inclusive organization compared to other groups. Thus logically, economic societies run by racists are less advanced (or in the wording style of racists: “inferior”) compared to other economic societies, which makes the whole case quite ironic.

In fact, all life forms and all economic societies have their own good reason to exist in the world: We cannot simply say which life form/economic society is superior or which is inferior. Do unto others as you would have them do unto you, seek common ground while reserving differences, are the solutions to the whole humanity for a bright future.

4.3.8 How do we promote communism in the world?

As has been discussed in Section 3.3.3, communist ideology and planned economy are entropy decrease factors in an economic society. Entropy decrease processes are non-spontaneous, which makes the worldwide promotion of communism really challenging. Yet being non-spontaneous does not necessarily mean being not realizable. Life itself, as a result of significant entropy decrease, prevails in the world.

According to Gibbs free energy equation,[36] if we would like to have spontaneous entropy decrease in a system, filling enthalpy into the system seems to be the only solution when temperature stays still. For human society, filling enthalpy into economic society signifies the activity of filling productivity into the economy. Only when people enjoys the fruits of economic development, that could make people realize rules are important. It should also be noted that the fruits of economic development should be accessible to all people in communist society, whereas in capitalist society, the fruits of economic development are only accessible to “elites”.

Communists have the historic role to promote communism in the world. For countries being exploited and looted by capitalism, unite of proletarians, fight against exploitation, trying to reallocate social resources (especially with regard to means of production) and liberating productivity are always the right solutions. Different countries always have different styles of culture and ideology, which means telling local people to do this or to do that only makes one a clown. Do something, rather than say something.

Infrastructure and technology is the real solution to realize productivity level-up: Thus helping other nations to build infrastructure and upgrade technology is a sensible way to promote communism in the world. Historically, the support from USSR of infrastructure construction and technology transfer to the newly established New China (156 Проектов) is a great example of promoting communism in the world. Prague Spring is a historical event of telling someone to do this or to do that, and is thus a negative example of promoting communism in the world.

Currently, China’s Belt and Road Initiative looks for trading opportunities with countries interested in the initiative. Since nothing could be obtained really for free, China would like to do business with the world with something in return. But the pricing policies set by Chinese suppliers are fundamentally different from capitalists.

Backed by technology superiority or monopoly or hegemony, capitalists seeks to earn supernormal profit as much as possible through any trading. As a comparison, China would like everyone in the world have access to products from the state-of-art technology at a reasonable price, especially in the realms of manufactured goods. Meanwhile, China also seeks to provide help to less-developed countries in need of infrastructure upgrade and technology improvement. In all, when people find that trading or cooperating with China

36. $\Delta G = \Delta H - T\Delta S$

really improves life quality, they might be interested in the ideology system that helps China to achieve.

RED AMERICA

is a publication of the American Communist Party.

Issue #005
March 2025

Subscription information

redamerica.acp.us